PRESENTED BY
DR. A. S. THIN.

The New England JOURNAL of MEDICINE

FORMERLY THE BOSTON MEDICAL AND SURGICAL JOURNAL

OFFICIAL ORGAN OF
THE MASSACHUSETTS MEDICAL SOCIETY
THE NEW HAMPSHIRE MEDICAL SOCIETY—THE VERMONT STATE MEDICAL SOCIETY
THE NEW ENGLAND SURGICAL SOCIETY—THE BOSTON SURGICAL SOCIETY, INC.
THE NEW ENGLAND PEDIATRIC SOCIETY AND
THE NEW HAMPSHIRE SURGICAL CLUB

OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 201, Number 14 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $7.56 | OCTOBER 3, 1929 | Published Weekly in Boston at 165 Newbury Street

CONTENTS

Cholesterol in Blood of Diabetics Treated at the New England Deaconess Hospital. *Hazel M. Hunt* 659

A Glycerol Modification of the Kahn Test. *William A. Hinton* and *Arthur Berk* 667

NEW HAMPSHIRE MEDICAL SOCIETY

The Smallpox Menace. *Henry O. Smith* 671

Discussion of "The Future of Rural Medicine" by John P. Bowler 674

Miscellany 676

THE NEW HAMPSHIRE SURGICAL CLUB

Sterility. *George F. Dwinell* 677

Address Delivered at the Dedication of the Roxbury Health Unit. *Charles F. Wilinsky* 688

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 15401—Epigastric Pain Relieved by Food. *Richard C. Cabot.* Case 15402—Can We Make a Differential Diagnosis? *William Martindale Shedden* 690

EDITORIALS

The Medical School and Medical History 697

This Week's Issue 698

(Contents continued on next page)

- - - - NEW

Jackson and Coates' Nose :: Throat :: Ear

Never before has so distinguished a group of authorities been brought together in one volume to present the nose, throat, and ear and their diseases.

Under the editorial supervision of Drs. Chevalier Jackson and George M. Coates these 74 specialists of America and Europe have written one of the most practical books that has ever been offered to the medical profession. Signs, symptoms, and diagnostic tests are laid before you in detail. Treatment is definite. Simple medical methods are emphasized, prescriptions are included, dosage is clearly given, surgical interference is indicated, and operative technic shown step by step.

There are 657 illustrations and 27 inserts in colors. Altogether, it is a monumental contribution to the knowledge of diseases of these organs, and will stand as the authority for many years to come.

By 74 American and European authors. Edited by CHEVALIER JACKSON, M.D., Sc.D., LL.D., F.A.C.S., Professor of Bronchoscopy and Esophagoscopy, Graduate School of Medicine, University of Pennsylvania, and Jefferson Medical College; and GEORGE MORRISON COATES, M.D., A.B., F.A.C.S., Professor of Otology, University of Pennsylvania Graduate School of Medicine. Assisted by CHEVALIER L. JACKSON, A.B., M.D., Assistant in Bronchoscopy and Esophagoscopy, Graduate School of Medicine, University of Pennsylvania. Octavo of about 1177 pages, with 657 illustrations and 27 inserts in colors. Cloth, $13.00 net.

W. B. SAUNDERS COMPANY **Philadelphia and London**

Entered at the Postoffice at Boston as Second Class Matter

PROPERTY OF THE
PATHOLOGY DEPARTMENT.

CONTENTS

(Continued)

THE DOCTOR'S SADDLE BAG

On Taking Oneself Seriously 698

BOOK REVIEWS

The Cytoarchitectonics of the Human Cerebral Cortex. Von Economo 707

Diabetics. J. K. Lund 708

Die Encephalitis lethargica; ihre Nachkrankheiten und ihre Behandlung. Prof. C. v. Economo 708

CORRESPONDENCE

A Comment on Dr. Pusey's Letter. Andrew F. Downing 702

A Defect in Medical Service. Wm. Bross Lloyd 702

Suggestions for the Treatment of the Potential Criminal. Mrs. F. Edgar Lediger 701

The Treatment of Bites by Rabid Dogs. George H. Bigelow 701

MISCELLANY

The Investigation of Air Pollution at the Mellon Institute 696

Prevention of Sunlight Starvation 687

The Thirteenth International Physiological Congress. (Continued.) 699

NEWS ITEM 703

NOTICES 703, 707

RECENT DEATHS 702

REPORT AND NOTICES OF MEETINGS 703

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES 707

The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held at Plymouth, June 10 and 11, 1930

OFFICERS AND STANDING COMMITTEES ELECTED BY THE COUNCIL, JUNE 11, 1929

PRESIDENT: ROBERT B. GREENOUGH, 8 Marlborough Street, Boston.
VICE-PRESIDENT: LESTER C. MILLER, 14 Oxford Street, Worcester.
SECRETARY: WALTER L. BURRAGE, 182 Walnut Street, Brookline.
TREASURER: ARTHUR K. STONE, Auburn Street, Framingham Center.

STANDING COMMITTEES FOR 1929-30

COMMITTEE OF ARRANGEMENTS
E. P. Hayden, H. Q. Gallupe, T. H. Lanman, F. H. Colby, G. P. Reynolds.

COMMITTEE ON PUBLICATIONS
Homer Gage, J. W. Bartol, R. I. Lee, R. B. Osgood, E. W. Taylor.

COMMITTEE ON MEMBERSHIP AND FINANCE
D. N. Blakely, Algernon Coolidge, Samuel Crowell, Gilman Osgood, H. L. Smith.

COMMITTEE ON ETHICS AND DISCIPLINE
David Cheever, W. D. Ruston, S. F. McKeen, A. C. Smith, R. L. DeNormandie.

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS
P. P. Johnson, A. G. Howard, H. P. Stevens, C. H. Lawrence, C. A. Sparrow.

COMMITTEE ON STATE AND NATIONAL LEGISLATION
R. B. Greenough, T. J. O'Brien, F. E. Jones, Shields Warren, A. W. Marsh.

COMMITTEE ON PUBLIC HEALTH
Dwight O'Hara, E. F. Cody, R. I. Lee, T. F. Kenney, F. G. Curtis.

COMMITTEE ON MALPRACTICE DEFENSE
F. G. Balch, E. D. Gardner, F. B. Sweet, R. P. Watkins, A. W. Allen.

OFFICERS OF THE SECTIONS FOR 1930

ELECTED BY THE SECTIONS

SECTION OF MEDICINE
Chairman, Francis W. Palfrey, Boston; *Secretary*, Albert A. Hornor, Boston.

SECTION OF SURGERY
Chairman, Irving J. Walker, Boston; *Secretary*, Leland S. McKittrick, Boston.

SECTION OF TUBERCULOSIS
Chairman, Walter A. Griffin, Sharon; *Secretary*, Sumner H. Remick, Boston.

SECTION OF PEDIATRICS
Chairman, Orville R. Chadwell, Boston; *Secretary*, Joseph Garland, Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY
Chairman, Louis E. Phaneuf, Boston; *Secretary*, Alonzo K. Paine, Boston.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY
Chairman, P. F. Butler, Boston; *Secretary*, Arthur H. Ring, Arlington Heights.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES BETWEEN APRIL 15 AND MAY 15, 1929

BARNSTABLE—*President*, S. M. Beale, Sandwich; *Vice-President*, C. J. Belle, Wellfleet; *Secretary*, J. L. Chute, Osterville; *Treasurer*, H. B. Hart, Yarmouthport; *Librarian*, E. E. Hawes, Hyannis.

BERKSHIRE—*President*, M. S. Eisner, Pittsfield; *Vice-President*, B. W. Paddock, Pittsfield; *Secretary*, H. J. Downey, Pittsfield; *Treasurer*, C. T. Leslie, Pittsfield.

BRISTOL NORTH—*President*, T. J. Robinson, Taunton; *Vice-President*, B. M. Latham, Mansfield; *Secretary*, J. L. Murphy, Taunton; *Treasurer*, J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President*, G. L. Richards, Fall River; *Vice-President*, W. A. Nield, New Bedford; *Secretary and Treasurer*, Charles Shanks, New Bedford.

ESSEX NORTH—*President*, R. L. Toppan, Newburyport; *Vice-President*, J. E. Bryant, Haverhill; *Secretary and Treasurer*, J. F. Burnham, Lawrence.

ESSEX SOUTH—*President*, T. L. Jenkins, Topsfield; *Vice-President*, H. P. Bennett, Swampscott; *Secretary*, R. E. Stone, Beverly; *Treasurer*, Andrew Nichols, 3d, Danvers; *Librarian*, C. M. Cobb, Lynn.

FRANKLIN—*President*, W. K. Clark, Greenfield; *Vice-President*, H. M. Kemp, Greenfield; *Secretary and Treasurer*, Charles Moline, Sunderland.

HAMPDEN—*President*, F. B. Sweet, Springfield; *Vice-President*, M. W. Pearson, Ware; *Secretary and Treasurer*, H. L. Smith, Springfield.

HAMPSHIRE—*President*, F. E. O'Brien, Haydenville; *Vice-President*, J. G. Hanson, Northampton; *Secretary and Treasurer*, L. O. Whitman, Northampton; *Librarian*, Jane B. Armstrong, Northampton.

MIDDLESEX EAST—*President*, F. T. Woodbury, Wakefield; *Vice-President*, James Blenkhorn, Stoneham; *Secretary*, A. R. Cunningham, Winchester; *Treasurer*, Richard Dutton, Wakefield; *Librarian*, J. M. Wilcox, Woburn.

MIDDLESEX NORTH—*President*, A. G. Scoboria, Chelmsford; *Vice-President*, J. A. Mehan, Lowell; *Secretary*, T. A. Stamas, Lowell; *Treasurer*, M. D. Bryant, Lowell; *Librarian*, P. J. Meehan, Lowell.

MIDDLESEX SOUTH—*President*, Fresenius Van Nüys, Weston; *Vice-President*, F. W. Gay, Malden; *Secretary*, A. A. Levi, Cambridge; *Treasurer*, Edward Mellus, Newton.

NORFOLK—*President*, S. F. McKeen, Brookline; *Vice-President*, W. A. Lane, Milton; *Secretary*, F. S. Cruickshank, Dorchester; *Treasurer*, G. W. Kaan, Reading.

NORFOLK SOUTH—*President*, G. M. Sheahan, Quincy; *Vice-President*, M. T. Sweeney, Atlantic; *Secretary, Treasurer, and Librarian*, N. R. Pillsbury, South Braintree.

PLYMOUTH—*President*, T. H. McCarthy, Brockton; *Vice-President*, F. W. Murdock, Brockton; *Secretary*, George A. Moore, Brockton; *Treasurer*, L. B. Packard, Brockton; *Librarian*, J. H. Weller, Bridgewater.

SUFFOLK—*President*, Lincoln Davis, Boston; *Vice-President*, W. H Robey, Boston; *Secretary*, L. S. McKittrick, Boston; *Treasurer*, John Rock, Boston.

WORCESTER—*President*, W. E. Denning, Worcester; *Vice-President*, J. W. O'Connor, Worcester; *Secretary*, E. C. Miller, Worcester; *Treasurer*, R. J. Ward, Worcester; *Librarian*, A. C. Getchell, Worcester.

WORCESTER NORTH—*President*, F. R. Dame, Athol; *Vice-President*, R. C. Jones, Fitchburg; *Secretary*, C. H. Jennings, Fitchburg; *Treasurer*, F. H. Thompson, Jr., Fitchburg.

Fellow Members! We want your support.

The New England
Journal of Medicine

VOLUME 201 OCTOBER 3, 1929 NUMBER 14

CHOLESTEROL IN BLOOD OF DIABETICS TREATED AT THE NEW ENGLAND DEACONESS HOSPITAL

BY HAZEL M. HUNT, A.B.†

SINCE carbohydrate metabolism has been found to be so directly dependent upon the activity of insulin in the body and can be so adequately restored to a state of equilibrium by insulin when once it has become deranged, a new means of studying the relationship of fat metabolism and carbohydrate metabolism is afforded.

The existence of such a relationship has long been known. Lipemia grossly visible has been associated with diabetes since the disease itself was recognized as an entity and the occurrence of abnormally high values for blood cholesterol, fatty acids and lecithin has been recognized for many years. In spite of the intensive research directed upon the subject of faulty lipid metabolism in the past two decades, many essential points in the problem of the relationship of this phenomenon to diabetes are still obscure. In 1916 Bloor[1], using a new method, found increased cholesterol values in the blood of diabetic patients in the clinic of Dr. E. P. Joslin. He demonstrated plasma cholesterol values ranging from 180 to 650 mgs. per cent. with an average for the group of 360 mgs. per cent. Gray[2] made a detailed study of 171 patients in the same clinic and found abnormally high values for blood fat in 78 per cent. of the series. His analyses were made for total fat, but the data can be interpreted in terms of cholesterol, owing to the parallelism existing between these lipids. Gray correlated the fat values he found with the duration of life in the fatal cases and became convinced that high fat values were of grave prognostic significance. These findings were verified by Rabinowitch[3] and the French workers Remond and Rouzard[4], who found that of seven patients who had values above 300 mgs. per cent. in a group of 189 diabetics only one survived two years after these findings. We shall later point out that an unfavorable prognosis is not justified upon this basis today. These early observations were concerned with patients treated before the discovery of insulin.

It is the aim of this study to investigate the relations existing between the lipids themselves in the blood of insulin-treated diabetics; to determine if the cholesterol value of the insulin-treated diabetic is as high as it was in pre-insulin days; to observe what influence insulin exerts on the cholesterol of the blood, and what relation age, duration and severity of the disease, diet and arteriosclerosis bear to the cholesterol content of the blood.

NORMAL STANDARDS

Bloor[1] obtained cholesterol values which varied from 190 to 310 mgs. per cent. in the plasma of 23 normal individuals with an average for the group of 236 mgs. per cent. Denis[5] reports 220 mgs. per cent. as the average normal value and a range of 167 to 255. Oser and Karr[6] report values of approximately the same range. Okey and Boyden[7] found, in studying normal young women over an extended period of time, that the same individual might have a blood cholesterol of 90 mgs. per cent. at one time and at another time a value of 300. In like manner other young women varied from 111 to 250 mgs. per cent., an increase of over 100 per cent. Ganalons[8] found the blood cholesterol level in women to be variable. Luden[9], Guillaumin and Vignes[10] and others have associated the wide range found in women with the menstrual cycle. Muller[11], in her work on cholesterol in cases of pernicious anemia, found that normal values varied widely in some instances and remained fairly stationary in other instances. Blix[12] noted that when observations are extended over fairly long periods, the cholesterol values in the same individual seem to vary within the extremes of the total normal range. It is generally accepted that the values obtained by the European methods are somewhat lower than those obtained by the methods in use in America. Throughout our work we have used the method of Bloor, Pelkan and Allen[13] for the cholesterol and fatty acid determinations and a modification of the Fiske-Subbarow[14] phosphorous method* for lecithin. Analyses were made on blood plasma in all instances. The blood was collected in the fasting state and analysis started as soon after collection as possible. In 40 normal healthy individuals of both sexes and of ages varying from 20 to 40 years we found values which range from 118 to 272 mgs. per cent. The average for this group is 177 mgs. per cent. Thus it appears that the level of cholesterol in normal individuals is by no means stationary, and we therefore have been unwilling to consider diabetic

†For record and address of author see "This Week's Issue," page 698.

*This modification was made under the supervision of Fiske and Subbarow.

cholesterol values abnormally high unless they exceed 230 mgs. per cent.

RELATIVE PROPORTIONS OF CHOLESTEROL, FATTY ACIDS AND LECITHIN IN THE PLASMA OF DIABETICS

To determine the relation of the major lipids to each other, a complete study of the cholesterol, fatty acid and lecithin values was made in a series of 146 diabetic patients. This study includes no coma patients or other patients undergoing such abnormal metabolic disturbances as gangrene or infection. The data are presented in Table I.

TABLE I

AVERAGE CHOLESTEROL, FATTY ACID AND LECITHIN VALUES IN 146 DIABETICS, BASED UPON RISING VALUES OF CHOLESTEROL

		AVERAGE VALUES		
CHOLESTEROL MGS PER CENT	NO. OF CASES	CHOLESTEROL MGS PER CENT	FATTY ACID MGS PER CENT	LECITHIN MGS PER CENT
100-150	12	138	352	274
151-200	51	180	385	279
201-225	19	211	390	291
226-250	28	238	404	341
251-300	19	275	453	383
301-400	15	325	427	400
401-500	2	415	437	351

As the cholesterol values increase there is also a proportional increase in lecithin and fatty acids. This indicates that the parallel relationship, found earlier by Bloor in the pre-insulin era, is not disturbed by insulin treatment. Cholesterol may still be considered an index of variations in total blood lipids.

BLOOD FAT VALUES IN DIFFERENT ERAS OF DIABETIC TREATMENT

If one compares the lipid values found in diabetes in the Allen under-nutrition era of therapy, 1914-1922, and the values found in the Banting era, one sees at once a marked difference. Because today only very mild diabetics are treated without insulin, one can compare the new data only with the data on the mild diabetics of the Allen era. Table II records the data which has been obtained in these two different periods in this clinic.

Thus it is seen that the non-insulin diabetic of today, compared with the mild diabetic of the Allen era, has a lower blood cholesterol value.

INSULIN

Insulin treatment is used in all cases in this clinic except in those extremely mild. The influence of insulin upon the blood cholesterol has been repeatedly noted in several clinics and it has been questioned whether the decrease in blood cholesterol coincident with insulin treatment in cases of acidosis has been due to a direct or indirect action of insulin. In Table III are shown the levels of blood cholesterol in patients of varying degrees of severity, and treated with varying amounts of insulin.

Of these 270 patients, 43 had never taken insulin and 18 have been able to discontinue insulin treatment. The average cholesterol value for all groups taking different amounts of insulin remains fairly constant. This seems to indicate that insulin is associated with a stabilizing effect upon the blood cholesterol. A severe diabetic patient on an average insulin dosage of 36 units a day can have a blood cholesterol not markedly different from that of his mild brother taking no insulin, whereas in the Allen era the severe diabetic had cholesterol values so high that they were of very bad prognostic character. The average value recorded by Bloor for the severe diabetic is 510 mgs. per cent. Practically none of our cases under present-day treatment shows a value as high as that. Only 2 of this series have cholesterol values over 500 mgs. per cent. blood and only 13 per cent.

Table II

COMPARISON OF BLOOD LIPID VALUES IN DIABETES TREATED WITHOUT INSULIN AT DIFFERENT PERIODS

		NO. OF CASES	CHOLESTEROL MGS PER CENT	FATTY ACID MGS PER CENT	LECITHIN MGS PER CENT
Allen Era	Mild diabetes	32	260	640	240
	Mod. diabetes	37	300	750	280
	Severe diabetes	55	510	1280	400
Banting Era	Mild diabetes	43	234	390	339

TABLE III

RELATION OF INSULIN DOSAGE AND BLOOD CHOLESTEROL VALUES

INSULIN UNITS	NO. OF CASES	AGE IN YEARS	DURATION OF DISEASE IN YEARS	CHOLESTEROL MGS. PER 100cc.	BLOOD SUGAR %	
Never Taken	43	19.0-70.4	0.1-24.9	146-329	0.08-0.27	Range
		30.9	8.5	232	0.15	Average
No Insulin Now	18	13.2-78.6	0.08-23.4	100-370	0.08-0.29	Range
		53.0	9.0	205	0.17	Average
Under 10	25	3.8-76.5	0.1-19.9	120-348	0.10-0.33	Range
Avg. 6		43.0	6.9	217	0.21	Average
10-19	60	5.2-72.1	0.2-25.6	116-416	0.06-0.40	Range
Avg. 13		44.3	7.4	225	0.20	Average
20-24	27	8.4-63.4	0.1-15.9	123-630	0.07-0.41	Range
Avg. 21		37.0	6.5	240	0.23	Average
25-50	82	5.5-68.7	0.2-27.5	154-420	0.03-0.50	Range
Avg. 36		30.0	6.2	230	0.25	Average
Over 50	15	12.7-87.3	3.4-10.2	141-311	0.08-0.34	Range
Avg. 63		24.4	6.6	208	0.22	Average

show values above 300 mgs., Gray's "diabetic danger line". It will be interesting to note in the future how really dangerous these values between 300 and 500 mgs. per cent. prove to be for the insulin-treated patient. There seems little question that the low values which are being

obtained today are due to the activity of the insulin, but our data do not indicate whether the action is direct or indirect.

DURATION

The duration of diabetes appears to exert but slight influence upon the height of the blood cholesterol. Of this series, the greatest number of patients studied were in the group having had the disease from five to ten years.

mal children and infants, found a variation of cholesterol with age only in the first few years of life, the values being higher the younger the child. Rabinowitch[18] determined the blood cholesterol in 44 normal children under fourteen years of age and found a range of cholesterol values similar to the range found in normal adults. Melka[19] studied 50 healthy middle-aged persons and found that 27 per cent. had a definite hypercholesteremia with values running as

TABLE IV

THE EFFECT OF DURATION OF DIABETES UPON THE BLOOD CHOLESTEROL

DURATION IN YEARS	NO.	AGE IN YEARS	CHOLESTEROL MGS PER 100cc.	BLOOD SUGAR PERCENT	INSULIN UNITS	
Less than 1 year	24	3.8-67.5	106-361	0.10-0.36	0-35	Range
0.4		32.3	199	0.19	10	Average
1-2	24	5.2-67.5	147-410	0.06-0.39	0-35	Range
1.6		31.8	230	0.20	15	Average
2-4	40	5.5-66.2	128-535	0.05-0.46	0-64	Range
3.0		33.3	242	0.21	22	Average
4-5	22	14.0-65.0	102-392	0.05-0.52	0-50	Range
4.6		35.6	220	0.26	29	Average
5-10	96	9.2-87.3	136-416	0.08-0.50	0-96	Range
6.9		35.8	233	0.21	25	Average
10-15	37	20.9-78.6	100-630	0.07-0.38	0-64	Range
12.5		54.3	242	0.20	14	Average
15-20	13	38.5-76.5	147-305	0.14-0.40	0-25	Range
17.2		59.7	201	0.23	9	Average
20 +	14	50.4-72.1	134-360	0.10-0.24	0-42	Range
23.2		62.1	222	0.16	12	Average

The data indicate a gradual increase in average cholesterol value in the early stages of the disease, but a fairly constant average cholesterol value is found above 5 years' duration, with perhaps a gradual decrease as the duration of the disease exceeds 15 years. The lowest average had values above the normal limit of 230 mgs. The lowest average cholesterol value occurs in the first year of the disease, although some individuals of this group had values above the normal limit of 230 mgs.

AGE

Age is not an influential factor in determining blood cholesterol values. Goldbloom and Gottlieb[15], Manicatide[16] and DeToni[17], studying normal high as 307 mgs. per 100 cc. Blix[12] found slightly increased plasma cholesterol in women between 40 and 48 years of age. White[20] found low blood cholesterol values in children and young adults but somewhat higher values in old age, but he was able to rule out age alone as an influencing factor in blood cholesterol values. Our data are recorded in the following table.

Age seems to have little influence upon the average blood cholesterol in our group, although it is apparent that young diabetics under ten years of age have much lower average values than the others in the series. It is possible that insulin may be responsible for these values as this group is the only one in which 100 per cent. of the members are taking insulin.

ARTERIOSCLEROSIS

Arteriosclerosis develops prematurely even in the juvenile diabetic and is increasingly important as a cause of death in adult diabetics. Explanation has been sought in the metabolic disturbance of diabetes, together with other factors such as increased strain upon the arteries in adult life. Aschoff has restated Virchow's theory in such a way as to lead us to compare our chemical results with the clinical evidences of arteriosclerosis in these cases. Aschoff regards the existence of hypercholesteremia as a condition favoring the deposition of cholesterin crystals in the arterial walls, which is later followed by calcification.

Our cases have been classified according to the degree of arteriosclerosis present as follows:

As. 0.....Artery not palpable.
" 1..... " just palpable.
" 2..... " rolls under finger.
" 3..... " is tortuous.
" 4..... " is beaded.

Table VI includes only cases over 20 years of age because of the extreme rarity of arteriosclerosis demonstrable clinically in patients under 20 years old.

Of this group of patients over 20 years of age 52 per cent. have no demonstrable arteriosclerosis. The lowest average blood cholesterol is found in the group with As4. As was found in an earlier study[21], an increase in circulating blood cholesterol does not go hand in hand with the degree of sclerosis. This is not quite in harmony with the investigations of Labbé and Heitz[22], who found high blood cholesterol associated with arthritis obliterans in diabetes, and Mjassnikow[23], who found high cholesterol values only in advanced stages of arteriosclerosis. If a relationship really exists, it is apparent that a high circulating blood cholesterol must have preceded the arteriosclerotic processes instead of accompanying them, at least at the time our studies were made.

Rabinowitch[24] reports high cholesterol values

TABLE V.

INFLUENCE OF AGE UPON THE BLOOD CHOLESTEROL IN DIABETES

AGE IN YEARS	NO. OF CASES	DURATION OF DISEASE	CHOLESTEROL MGS PER 100cc.	BLOOD SUGAR per cent	INSULIN UNITS	
Under 10 years	16	0.1-6.0	120-278	0.06-0.39	6-34	Range
7.3		1.9	189	0.18	17	Average
10-20	61	0.1-9.1	138-420	0.05-0.46	0-96	Range
14.6		4.3	224	0.23	35	Average
20-30	19	0.2-10.5	102-410	0.08-0.50	0-64	Range
23.2		5.7	224	0.23	31	Average
30-40	35	0.1-18.5	123-535	0.03-0.41	0-52	Range
35.4		6.4	245	0.20	17	Average
40-50	26	0.7-14.5	109-366	0.10-0.38	0-45	Range
45.0		6.6	228	0.23	18	Average
50-60	61	0.5-25.1	106-630	0.09-0.39	0-46	Range
55.4		8.7	230	0.20	13	Average
60-70	45	0.1-25.0	100-370	0.05-0.30	0-42	Range
64.2		10.8	235	0.19	11	Average
70-80	56	5.2-25.6	147-241	0.10-0.33	0-15	Range
73.5		17.3	190	0.20	6	Average
Over 80	1	8.0	162	0.25	95	Range
87.3						

in patients with marked arteriosclerosis. Of his group of 16 non-diabetic arteriosclerotics the average cholesterol value was 249 mgs., as compared with an average value of 344 for the diabetic sclerotics. In our series, the group showing no sclerosis is the one having the largest average insulin dosage, the shortest average duration of disease and the youngest average age.

Arteriosclerosis in the vessels of the legs was discovered by roentgenogram in 6 cases of this group under 20 years of age. Case No. 2363 is a girl of 15.2 years of age who has had diabetes for 6.5 years. She is a reliable moderate diabetic, 2½ inches below standard height, with a daily insulin dosage of 40 units and daily fat intake of 109 grams. Her blood cholesterol is 207 mgs. per cent., fatty acid 411 mgs. per cent. and lecithin 267 mgs. per cent. Case No. 3620 is a pituitary dwarf, a boy of 16.3 years who has had moderately severe diabetes for 6.2 years. His blood fat values, too, are not high. His cholesterol is 185 mgs. per cent., fatty acid 475 mgs. per cent., and lecithin 356 mgs. per cent. Case No. 2007 is a boy of 12.7 years with moderate diabetes of 7.1 years' duration. His blood cholesterol at the last examination was 165 mgs. per cent. He is a hereditary diabetic with a high daily dosage of insulin (75 units) and calcification demonstrable by x-ray had developed within six months of his present examination. Six months prior to this examination he had no arteriosclerosis and had a blood cholesterol value of 200 mgs. per cent. At this examination he had a discharging tuberculous sinus, which may have accounted for the lowered cholesterol value. Case No. 6416 is a severe diabetic 14.5 years old with a duration of disease of 6.1 years. He has a daily dosage of 50 units of insulin and his cholesterol value is 138 mgs. per cent., fatty acids 361 mgs. per cent. and lecithin 200 mgs. per cent. Case No. 2617 is a mild diabetic 10.9 years of age and with a duration of disease of 5.8 years. Her insulin dosage is 36 units per day. Her cholesterol values have always been high and during the past two years have ranged from 298-490 mgs. per cent. Within the past six months arteriosclerosis has become demonstrable and her cholesterol value has remained unchanged during that time. Case No. 2757, a boy of 16.1 years who has had diabetes for 5.5 years, also has a cholesterol value above the normal range. His cholesterol is 327 mgs. per cent., fatty acid 505 mgs. per cent. and lecithin 419 mgs. per cent. His daily insulin dosage is 30 units. In none of the first 4 cases was there ever a markedly high blood cholesterol, whereas the last two cases show values well above the normal.

TABLE VI.

ARTERIOSCLEROSIS AND BLOOD CHOLESTEROL IN DIABETES

DEGREE OF SCLEROSIS	NO. OF CASES	AGE IN YEARS	DURATION OF DISEASE	CHOLESTEROL MGS. PER 100cc.	BLOOD SUGAR %	INSULIN UNITS	
0	52	24.9-67.5	0.1-11.4	123-535	0.07-0.41	0-64	Range
		42.2	5.9	234	0.20	20	Average
1	44	20.4-71.8	0.2-22.0	134-416	0.08-0.49	0-40	Range
		45.1	8.7	233	0.22	15	Average
2	48	23.0-78.6	0.2-25.6	106-630	0.10-0.33	0-40	Range
		52.8	9.7	249	0.20	16	Average
3	34	42.5-87.3	0.1-27.5	109-370	0.05-0.40	0-95	Range
		60.4	9.8	216	0.18	15	Average
4	15	22.9-72.0	1.0-23.6	100-304	0.09-0.50	0-40	Range
		54.1	10.4	195	0.21	12	Averag

No patients under 20 years of age were included in this table of the group now under study.
71 patients under 20 years of age have no arteriosclerosis.
4 patients have arteriosclerosis No. 1.
1 patient has arteriosclerosis No. 2.
1 patient has arteriosclerosis No. 4.

SEVERITY OF DISEASE

The severity of the disease, when adequately treated with diet and insulin, appears to have little influence upon the blood cholesterol, possibly because the majority of patients are mild

diabetics. Of the 270 patients studied, 72 per cent. are mild diabetics. The basis used for classification of the diabetics as mild, moderate, or severe was the carbohydrate tolerance as determined by the carbohydrate intake and output and by the insulin dosage, assuming one unit of insulin to be equivalent to one gram carbohydrate. On this basis all patients having a carbohydrate tolerance above 75 grams were classified as mild, those with a tolerance of between 50 and 75 as moderate and those with a tolerance less than 50 grams as severe. The blood cholesterol values for the whole group range from 100 to 630 mgs. per cent. and while the average value for the group is 239 mgs. per cent., 156, or 58 per cent., have values below 230, the upper normal limit.

TABLE VII

RELATION OF CHOLESTEROL VALUES TO SEVERITY OF DISEASE

	AVERAGE					
DEGREE OF SEVERITY	NO. OF CASES	AGE IN YEARS	DURATION OF DISEASE IN YEARS	CHOLESTEROL MGS PER CENT	BLOOD SUGAR %	INSULIN UNITS
Mild	196	45.0	7.4	224	0.19	12
Moderate	24	20.8	7.0	207	0.20	33
Severe	50	28.1	6.0	256	0.26	45

However, there are severe cases with cholesterol values as low as 102 mgs. per cent. and 38 per cent. of the severe cases are in the normal zone. Mild cases with high blood cholesterol values also occur. A direct relationship between severity and height of blood cholesterol apparently does not exist in this group.

The wide variation of cholesterol which is found in all the previous classifications in this paper is especially apparent here. Fourteen per cent. of the moderate and mild cases have values which may be considered of unfavorable prognosis, but only one of the mild patients with high values has died since this investigation started, and she died in coma one year after a cholesterol finding of 375 mgs. per cent.

EFFECT OF FOOD

Food appears to have an influence upon blood cholesterol not as yet thoroughly understood. Bloor[25], Landau[26], Luden[9], Blaisdell and Chandler[27] have reported increases in blood cholesterol where diets rich in cholesterol are fed. McClure and Huntsinger[28] find increased blood cholesterol after a meal, regardless of the character of the food stuff. Data which conflicts with this view have been presented by Wishart[29] and Randles and Knudson[30]. Eggs have been used very freely in the experimental cholesterol-rich diets. Mjassnikow[31] fed 8 eggs at one meal for several days. In healthy subjects no increased blood cholesterol was detected after eating eggs for some time. Of our present series of cases 15 were regularly taking more than two eggs per day, the average for the group was 4 eggs per day, and yet the average cholesterol value was but 201 mgs. per cent. Only one of the group had marked arteriosclerosis and this patient had regularly 3 eggs per day and had a blood cholesterol of 200 mgs. per 100 c.c. Case No. 1452, a mild diabetic taking 4-5 eggs per day for an indefinite period, has no demonstrable arteriosclerosis although he is 69.7 years old. His blood cholesterol is 222 mgs. per cent. Case No. 3194 has eaten 5 eggs a day for at least 7 years and her cholesterol value is 0.207 per cent. Although eggs probably contain more cholesterol than any other foods included in the regular dietary, we find that they have little influence in increasing the blood cholesterol. However, the number of eggs per day in the diet of Case No. 3017 has been sharply reduced and in the past three months the cholesterol value has dropped from 320 mgs. per cent. to 211 mgs. per cent. A corresponding drop in fatty acids has also occurred. One hesitates to attribute too much importance to this single observation in face of the wide variations noted, but similar experiments are to be initiated and one will watch with care the development of any blood cholesterol reduction.

EXTREME CHOLESTEROL VALUES

Wide extremes have been found in this study. A few patients show markedly increased values for cholesterol, even without coma. One instance occurred in a girl 13.5 years old who had had diabetes 1.3 years. The cholesterol was 570 and the fatty acid at the same time was 525. Eight months earlier this patient had come into the hospital with 6 per cent. sugar in the urine and marked acidosis. Her cholesterol value at that time was 884 mgs. per cent. and the fatty acid was 1152. One day later, with insulin treatment,

the cholesterol had dropped to 682. Eight months later it was the value recorded above. i.e., 570, and one year later it had dropped to 420 mgs. per cent. with fatty acid value of 409. Two years ago a prognosis in this case, based on cholesterol, would have been very poor, but today, even though a high value still persists, the gradual decrease indicates a much more favorable outlook. More important still, this gradual reduction may be an indication of a fundamental metabolic adjustment which occurs gradually during the first 2 years of the disease.

The lowest value found in our series was 100 mgs. per cent. This patient is a mild diabetic 60 years of age, who has had diabetes 13.3 years. At one time he had taken 10 units of insulin per day, but this was during a period when he had active gangrene. Both legs were removed and his general condition improved very markedly.

A diabetic of moderate severity, case No. 6359, had a cholesterol value as low as 102 mgs. per cent. She was 23.1 years old at the time of the test, had had diabetes 5 years, and was receiving 40 units insulin per day. She has calculi in the pancreas and marked arteriosclerosis in her legs, demonstrable by x-ray. Her case is reported in detail by Morrison & Bogan[32] and the roentgenogram appears in a recent article by Fitz[33] in Oxford Loose-Leaf Medicine.

It has been impossible in this study to classify the patients clinically so that cholesterol values of the same level would be found in the same groups. Regardless of how the data are classified, it will be noted that very wide ranges of cholesterol levels are found. Not even in coma cases, the data of which will be presented later, can one say that the cholesterol values for a certain clinical condition will fall within a stated limit.

That this is true in normals as well as in pathological cases, except to a less degree, serves to emphasize that the relationship of fat metabolism to the blood fat is still obscure.

TABLE VIII

PATIENTS TAKING MORE THAN TWO EGGS PER DAY.

CASE NO.	AGE IN YEARS	DURATION OF DISEASE IN YEARS	CHOLESTEROL MGS PER CENT	BLOOD SUGAR %	INSULIN UNITS	AS.	EGGS
2007	12.7	7.1	165	0.11	75	1	2-4
2759	16.1	5.5	327	0.24	30	1	3
3175	37.8	5.0	242	0.33	40	1	4
1949	14.5	7.6	183	0.29	34	0	3
1452	69.7	10.5	222	0.11	0	0	4-5
2847	17.6	8.5	156	0.19	51	0	1-3
3502	17.3	4.4	141	0.29	96	0	2-4
2489	13.9	6.5	189	0.45	49	0	3
632	46.0	15.9	229	0.16	24	1	4
4396	63.8	1.5	154	0.26	25	3	3
5555	50.4	22.0	134	0.20	0	1	4
5163	58.7	0.8	200	0.21	35	3	3
1902	66.6	18.8	200	0.16	10	4	3
2084	12.1	9.1	221	0.19	24	0	3
5194	55.1	4.8	262	0.25	45	2	4

The average cholesterol for the group is 202 mgs. per cent.

SUMMARY

1. The values for cholesterol, lecithin and fatty acid found in the plasma of 146 diabetics and the cholesterol values in the plasma of 40 normal and of 270 diabetics treated with insulin are reported.

2. Normal values for cholesterol in the blood plasma of 40 normal individuals were found to vary from 118 to 272 mgs. per 100 c.c. The average value for the group was 177 mgs. per cent.

3. Insulin-treated diabetics kept on an adequate diet without high fat do not have a concentration of cholesterol in the blood markedly above the normal. This is in marked contrast to the blood sugar which in insulin-treated diabetics shows greater range than before insulin therapy was instituted. Cholesterol still seems to be a more consistent guide to the real condition of the patient than the blood sugar.

4. The same parallel relationship is found to exist between cholesterol, fatty acid and lecithin in insulin-treated diabetes as was found to exist in health and in diabetes in the pre-insulin era. Cholesterol values can still be considered an index of variations in blood lipids.

5. Cholesterol values in mild diabetics treated with insulin are lower than cholesterol values in mild diabetics in the Allen era and markedly lower than the values in moderate and severe diabetics in the same period.

6. Treatment with insulin maintains the blood cholesterol of severe diabetics near the normal value.

7. The duration of diabetes has little influence on the value of the blood cholesterol.

8. The age of the patient does not affect the blood cholesterol values.

9. Blood cholesterol values are not found to be high in arteriosclerosis. The group which shows the lowest average blood cholesterol is the one showing greatest arteriosclerosis. The cholesterol values in our series can not be definitely correlated with any impending or existing arteriosclerotic process.

10. Diets rich in eggs do not lead to high cholesterol values in the limited number of our cases thus far studied, but in one case the omission of eggs from the diet has been followed by a reduction in the plasma cholesterol.

11. Attention is called to the wide range of cholesterol values which is found in every classification. Further study in an attempt to explain the enormous range of values in normal as well as pathological cases is invited.

It is a pleasure and privilege to acknowledge the constant stimulation and support of Dr. Joslin and his associates throughout this study. To my present assistants, Miss Mary Irwin and Mr. Earl Lehnherr, and to former assistants, Dr. Helen Updegraff and Mr. Harold Bean, I am greatly indebted for their enthusiastic co-öperation in this work.

REFERENCES

1 Bloor: Jour. Biol. Chem., 1916, 26: 424.
2 Gray: Am. Jour. Med. Sc., 1924, 168: 35.
3 Rabinowitch: Arch. Int. Med., 1929, 43: 363-371; Canad. M. A. J., 1927, 17: 171.
4 Remond and Rouzard: Bull. de l'Acad. de Med., 1923, 89: 60.
5 Denis: Jour. Biol. Chem., 1917, 29: 93.
6 Oser and Karr: Arch. Int. Med., 1925, 36: 507.
7 Okey and Boyden: Jour. Biol. Chem., 1927, 72: 261.
8 Ganalons: As. Med. Argent. Rev., 1917, 26: 1091.
9 Luden: Jour. Lab. and Clin. Med., 1917, 3: 141.
10 Guillaumin and Vignes: Comp. rend. Soc. de biol., 1928, 99: 618.
11 Muller: Paper read before Boston Biological Society April 26, 1929.
12 Blix: Studies in Diabetic Lipemia, Lond., 1925.
13 Bloor, Pelkan and Allen: Jour. Biol. Chem., 1922, 52: 191.
14 Fiske and Subbarow: Jour. Biol. Chem., 1925, 66: 375.
15 Goldbloom and Gottlieb: Canad. M. A. J., 1927, 17: 133.
16 Manicatide, Bratesco, and Rusesco: Comp. rend. Soc. de Biol., 1927, 96: 1240.
17 De Toni: Pediatria, Naples, 1925, 33: 987.
18 Rabinowitch: Arch. Int. Med., 1929, 43: 372.
19 Mélka: Bratisl. lekár. listy, 1927, 5: 296.
20 White: Quart. J. Med., 1926, 19: 159.
21 Joslin: Treatment of Diabetes Mellitus, 4th ed., 1928, Lea & Febiger.
22 Heitz: Ann. de Med., 1923, 14: 378, and Labbé and Heitz: 1925, 18: 108.
23 Mjassnikow: Ztschr. f. Klin. Med., 1925, 102: 65.
24 Rabinowitch: [See (3) and (18)].
25 Bloor, James and Gillete: Proc. Soc. Exp. Biol. and Med., 1925, 22: 251.
26 Landau: Ann. de Med., 1925, 18: 143.
27 Blaisdell and Chandler: Am. J. M. Sc., 1927, 174: 492.
28 McClure and Huntsinger: Jour. Biol. Chem., 1928, 76: 1.
29 Wishart: J. Metabolic Rev., 1922, 2: 199.
30 Randles and Knudson: Jour. Biol. Chem., 53: 53, 1922.
31 Mjassnikow: Ztschr. f. Klin. Med., 1926, 103: 767.
32 Morrison and Bogan: New England. J. Med., 1928, 199: 1129.
33 Fitz: Oxford Loose-Leaf Medicine, 1929, 4: 131.

A GLYCEROL MODIFICATION OF THE KAHN TEST*

BY WILLIAM A. HINTON, M.D.,† AND ARTHUR BERK, M.D.†

IN the course of a study on sero-precipitation methods for the diagnosis of syphilis, we observed that the use of a 5 per cent. solution of sodium chloride as a diluent in the Kahn reaction and the subsequent addition of 50 per cent glycerol *remarkably* increased the amount of the precipitate formed in the presence of syphilitic serums, while no visible precipitate was formed in the presence of non-syphilitic serums. In consequence of this observation, we have compared Kahn's test[1] with our modification of it and with the Hinton test[2]. In our experience, the modification of the Kahn test, which will be described presently, entirely overcomes the two greatest technical obstacles in the way of the practical application of the original Kahn test, namely, difficulty in reading the test and the occasional instance when a whole set of reactions are not sufficiently clear-cut for dependable readings. The desirability of using an easily read, sensitive precipitation test in conjunction with the Hinton test (an agglutination reaction) grew out of the fact that, in spite of the in-

*Conducted under a grant from the Committee on Research in Syphilis, Inc.

From the Division of Research and the Laboratory Department of the Boston Dispensary.

†For record and address of author see "This Week's Issue," page 698.

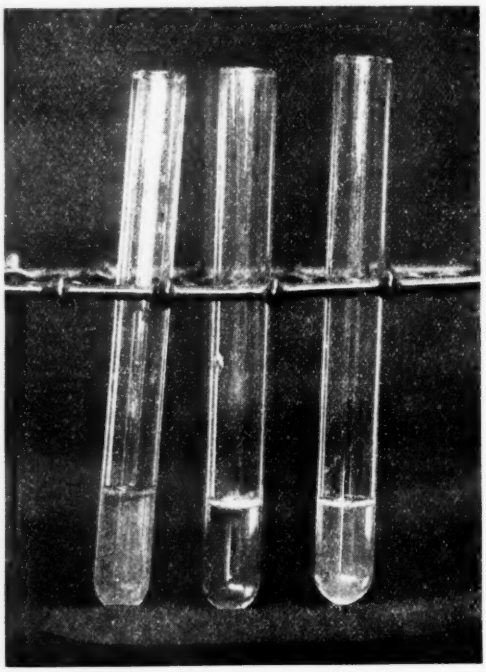
creased sensitiveness of the latter, there occasionally occurs the rare case with a definite history of syphilis and unmistakable signs of the disease, where the original Kahn test or the Wassermann test, or both, are positive and the Hinton test is negative. In our series of 241 cases to be described this has occurred but once.

The method of performing the Kahn test, according to our modification, was as follows: The antigen was prepared as described by Kahn. Dried heart muscle obtained from the Digestive Ferments Company of Detroit and labeled "Bacto Heart" was extracted four times with ether. One part, by weight, of the dried muscle was extracted with three volumes of ether (U. S. P.), the ethereal extract filtered off and the extraction repeated three times, making four extractions in all. The mixture was shaken for approximately ten minutes during each extraction. The residue of the powder was finally dried and extracted with 95 per cent. alcohol in the proportion of one part, by weight, of the dried powder to five parts of 95 per cent alcohol. To 100 c.c. of the extract thus obtained 0.6 gram of Merck's cholesterol was added. Titration to determine the optimum quantity for use in the test was carried out according to Kahn's instructions.

"One c.c. cholesterinized antigen is added to each of five standard antigen dilution tubes (5.5 cm. length and 1.5 cm. diameter). To five similar tubes are added the following amounts of physiologic salt solution, respectively: 0.8, 0.9, 1.0, 1.1, and 1.2 c.c. Each salt solution tube is emptied into a given antigen tube and, without waiting to drain the salt solution, the mixture is immediately poured back and forth five or six times to permit thorough mixing. Each of the five antigen dilutions will show the presence of a definite precipitate.

"The antigen dilutions are allowed to stand for 30 minutes, after which the solubility in salt solution of each of the precipitates in the dilution is tested as follows: 0.05, 0.025, and 0.0125 c.c. amounts, respectively, of each antigen dilution are pipetted with a 0.2 c.c. pipette graduated in 0.001 c.c. to the bottom of each of three tubes (7.5 cm. length and 1 cm. diameter). 0.15 c.c. quantities of physiologic salt solution are now added to each tube. The rack is shaken vigorously for 3 minutes, after which salt solution is added to each tube—1 c.c. to the 0.05 c.c. antigen amounts and 0.5 c.c. to the others—and observation made as to whether or not the original antigen dilution precipitate has gone back into solution. The antigen dilution tube containing the smallest amount of salt solution in proportion to antigen having a precipitate which goes back into solution in salt solution represents the endpoint of this titration and determines the proportion in which antigen is to be mixed with salt solution in the performance of the tests."

The optimum proportion of alcoholic cholesterinized antigen to physiologic salt solution thus obtained was used in an examination of our serums. The antigen was prepared for routine use with 5 per cent. sodium chloride, and the amounts of 0.05 c.c., 0.025 c.c. and 0.0125 c.c. were pipetted into three tubes respectively. (We have subsequently observed that this dilution may be made with 0.85 per cent. instead of 5 per cent salt solution.) To each of these tubes was added 0.15 c.c. of the serum to be tested. The tubes were shaken for three minutes, and 5 per cent. salt solution was added instead of the 0.85 per cent. salt solution used by Kahn. Immediate readings could be made, but the criterion of positivity was differential rather than absolute, for even the negative reactions showed some precipitate. The positives, of course, contained a much larger amount of precipitate.



The first tube, reading from left to right, shows a uniform opalescence without precipitation or any scum on the top. This represents a negative reaction. It does not change in appearance upon shaking.

The second tube shows the dense, tenacious film on the top of the mixture, with complete clearing in the fluid below. This tube represents a positive reaction before it is shaken.

The contents of the third tube appear opalescent in the photograph, but in the tube itself there was a very coarse granularity (precipitation) with some large flakes which can be seen in the picture. It was not shaken vigorously and a perceptible amount of the scum still remains on the top. This last tube represents the appearance of a positive reaction after shaking.

In each instance the tube containing .05 c.c. of the antigen was selected for this photograph. They had been incubated at 37° for 16 hours.

Fifty per cent. neutral glycerol (Baker & Adamson's C. P.) in distilled water was then added to each of the tubes and incubation carried out over night at 37° C. After this period of incubation, the positives manifested themselves in the following way: A dense, rather tenacious film formed on the top of the mixture in the tubes. Almost without exception, the fluid below was clear. On shaking, relatively dense flakes of precipitate were manifest throughout the

fluid. The modified test could be read quite as easily at arm's length as by the closest inspection. Occasionally a thin scum formed on the top of the negative tubes, but on shaking no precipitate was manifest and for the most part there was no change from the appearance of the mixture when the components were pipetted.

On the preceding page are illustrations of photographs of a positive and a negative reaction.

It is believed that a small group of cases, carefully studied from both the laboratory and clinical viewpoint, is more valuable than wholesale comparisons of various laboratory procedures in the diagnosis of syphilis without regard to the clinical findings. In consequence of this fact, we have studied a group of 241 consecutive patients. In this group, 97 patients showed clinical evidence of syphilis; 136 patients showed no evidence of syphilis; and 8 patients showed evidence that was suggestive of syphilis. On the eight doubtful cases follow-up work could not be completed because of their failure to return to the Dispensary or consent to lumbar puncture.

The groups of syphilitic and non-syphilitic patients are included in Table I. Our series, as tabulated, is too small to determine the relative percentage of positivity with any great degree of accuracy, but for ready comparison of the three tests percentages are included.

Of the 97 *treated* syphilitic patients, the Hinton test showed positive reactions in 63 cases, the Modified Kahn test in 44 cases, and the Kahn test in 37 cases. In other words, the Modified Kahn test was more sensitive than the original Kahn test, but not as sensitive as the Hinton test. The increased sensitiveness of the Hinton test has been cited by Cheever and Splaine[3], C. Morton Smith[4], and Ferguson and Greenfield[5].

Of the 136 non-syphilitic patients, the Hinton test and the Modified Kahn test agreed in showing negative reactions in all of the 136 cases, while the original Kahn test was negative in 131 cases and doubtful in 5 cases. There were no doubtful cases in the group with the Hinton and Modified Kahn tests.

Of the last group of 8 patients (not included in the table) that showed evidence suggestive of syphilis, one was the wife of a paretic. She showed a negative Hinton test, a positive Kahn test, and a negative test by our Modified Kahn. There was no history of lues, and physical examination revealed nothing. A lumbar puncture appointment was made but the patient put it off indefinitely.

The second case was that of a man who denied syphilis, but physical examination revealed a right pupil that was larger than the left. All three tests were negative. He did not respond to follow-up.

The third patient had a negative Hinton test, a doubtful Kahn test, and a negative Modified Kahn test. She refused to have any further study made.

The fourth case was that of a woman who was being treated for gonorrhea. The Hinton test was negative, the Kahn test doubtful, and the Modified Kahn test negative. A follow-up letter to her was returned unopened.

The fifth case was that of a girl 15 years old, single, a factory worker. There was a history of exposures. Physical examination revealed an erosion on the upper lip of the cervix. Her case showed a negative Hinton test, a doubtful Kahn test, and a negative Modified Kahn test. She did not respond to follow-up letters.

The sixth case was that of a man whose blood tests were as follows: negative Hinton test, positive Kahn test, and negative Modified Kahn test. There was no history of syphilis and nothing remarkable was found in the physical examination. He did not respond to follow-up letters.

The seventh case was that of a colored girl who gave a history of exposures. She showed a positive Hinton test, a negative Kahn test, and a negative Modified Kahn test. Follow-up letters to her were not answered.

The eighth case was that of a man whose blood tests were all negative. The skin department had suspected secondary lues. The patient did not respond to follow-up letters.

Of the 97 cases showing positive clinical evidence of syphilis, the three tests were positive in 33 cases and negative in 23 cases. There were disagreements in 39 cases. In one case, the Kahn test was unsatisfactory, and in another case the Modified Kahn test was not done.

In Table II there is shown in detail the number of cases in which the tests agreed and disagreed.

The 10 cases showing positive Hinton tests,

Table I

Syphilitic patients: 97 cases	Positive	Doubtful	Negative	Not Done
Hinton Test	63 (65%)	9 (9%)	25 (26%)	0
Kahn "	37 (38%)	4 (4%)	55 (56%)	1 (1%)
Modified Kahn "	44 (45%)	0	52 (53%)	1 (1%)
Non-syphilitic patients: 136 cases	**Positive**	**Doubtful**	**Negative**	**Not Done**
Hinton Test	0	0	136	0
Kahn "	0	5	131	0
Modified Kahn"	0	0	136	0

negative Kahn tests, and positive Modified Kahn tests in Table II are described below.

CASE No. 1. Male, age 50, had a chancre in 1909 at the age of 30. His spinal fluid was negative in 1928. He had received a good deal of treatment.

CASE No. 2. Male, age 37, had a chancre in 1916 at the age of 24. He received only three injections of arsphenamine. As his blood report was negative, he was discharged as cured in 1916. He came in for itching skin (epidermophytosis).

CASE No. 3. Male, age 49, had a chancre in 1909 at the age of 29. His spinal fluid was negative. He received a good deal of treatment.

CASE No. 4. Male, age 30, had secondary lues September 1923. He received inadequate treatment off and on for four years. His spinal fluid was negative in 1927. He has received continuous treatment since then.

CASE No. 5. Male, age 30, had a chancre in 1926 at the age of 27. His spinal fluid was negative. He has late secondary lues now, and is receiving continuous treatment.

CASE No. 6. Male, age 30, acquired a chancre approximately 26 days before blood test. The dark field examination revealed many spirochetes. He received four injections of 0.3 gm. of arsphenamine before the blood test.

CASE No. 7. Male, age 19, acquired a chancre approximately 13 days before blood test. The dark field examination revealed many spirochetes. He received three injections of 0.3 gm. of arsphenamine before the blood test.

CASE No. 8. Female, age 27, has a diagnosis of congenital lues. She presented interstitial keratitis.

CASE No. 9. Female, age 52, had a diagnosis of latent lues. She has received a good deal of treatment. Her spinal fluid was negative.

CASE No. 10. Female, age 46, had a diagnosis of latent lues. She has received little treatment. Her spinal fluid was negative.

Because of the ease with which the Modified Kahn test can be conducted, we are experimenting with it further in the hope of devising an even more sensitive test without loss of specificity, which will give a positive reaction in the rare case where both the Hinton and Kahn tests are negative and where the Wassermann test and clinical findings are positive.

Résumé. A simple modification of the Kahn reaction has been described which, although less sensitive than the Hinton test, has been helpful in the serum diagnosis of syphilis. This modification is easier to read than the original Kahn test, is more sensitive than the original Kahn test, and in our hands has not been subject to the variations occasionally encountered with the original Kahn test.

Table II

Number of cases	Hinton	Kahn	Modified Kahn
33	Positive	Positive	Positive
23	Negative	Negative	Negative
15	Positive	Negative	Negative
10	Positive	Negative	Positive
7	Doubtful	Negative	Negative
2	Positive	Positive	Negative
2	Doubtful	Doubtful	Negative
1	Positive	Doubtful	Negative
1	Negative	Doubtful	Negative
1	Negative	Positive	Negative
1	Positive	Unsatisfactory	Positive
1	Positive	Positive	Not Done
Total 97			

The authors wish to express their thanks to Miss Genevieve O. Stuart, Assistant Bacteriologist of the Wassermann Laboratory of the Massachusetts Department of Public Health, for the preparation of the Kahn antigens used in this comparative study.

REFERENCES

1 Kahn, R. L.: Serum diagnosis of syphilis by precipitation. Williams & Wilkins Co., Baltimore, 1925.
2 Hinton, W. A.: A glycerol-cholesterol precipitation reaction in syphilis. Boston M. & S. J., 196:993-996, June 16, 1927.
3 Cheever, A. W., and Splaine, R. L.: The Hinton glycerol-cholesterol precipitation reaction. New England J. Med., 199:967-975, November 15, 1928.
4 Smith, C. M.: The Hinton glycerol-cholesterol precipitation reaction in syphilis. Arch. Derm. and Syph., 19:439-448, March, 1929.
5 Ferguson, J. H., and Greenfield, E. C.: Value of the Hinton test in the serum diagnosis of syphilis. Brit. M. J. 1:492-494, March 16, 1929.

NEW HAMPSHIRE MEDICAL SOCIETY

THE SMALLPOX MENACE*

BY HENRY O. SMITH, M.D.†

DURING the early months of this year items appeared in the medical journals reporting an increasing incidence of smallpox in some of the western states. Illinois, in January, reported 548 cases, the largest number in any month since 1921. California reported exactly the same number, 548, from January 1 to April 1.

The newspapers of April 17 printed a dispatch from London: "Seven deaths from smallpox occurred among the passengers and crew of the liner Tuscania after several hundred passengers had landed at Marseilles and had travelled across France to London. France, in self-defense, decreed that all visitors entering that country from England must present certificates that they had been vaccinated within two months. London hotels are full of Americans from the Mauretania and the Leviathan indignant at the prospect of having to be revaccinated before continuing their journey to France. The London *Times* upholds the right of France, where vaccination is compulsory, to maintain its defenses."

Illinois, California and France, however, seem far away, and occurrences at a distance often fail to impress us, but on April 25th many cases of smallpox were found in the town of Middleboro, Mass. By May 10th about 100 cases had been reported. Our own State press, in the week beginning March 25, featured several happenings of intimate concern to us all. At least one newspaper used a scare head in large capitals announcing that a member of the legislature had contracted smallpox. Then an enquiring reporter discovered that in the village schools of a certain town 157 children out of a membership of 253 never had been vaccinated. A few days later came the story that the supreme court of the state, in its April session, would be called on to determine the constitutionality of the state vaccination law.

At just this time the reader of the daily doings of our legislature learned that the senate of the state of New Hampshire had actually passed an amendment to the law providing for the vaccination of school children which read as follows: "No child shall attend a public or private school in this state unless he has been vaccinated; or has had the smallpox; or has submitted not less than three times to the process of vaccination; or holds a certificate from the local board of health or from the regular family physician or from the practitioner who regularly serves the family that he is an unfit subject for vaccination." The bars were let down! Under the terms of this amendment the chiropractor, the new thought leader, or the local board, made up in my own town, for example, of a farmer, two clerks and a carpenter, could nullify the vaccination law!

The utter folly of this amendment was so manifest that the senate, a dose of the elementary facts of preventive medicine having been hastily administered, recalled the bill from the house before the latter body had taken final action on it.

These occurrences, thus chronicled, are vivid reminders of the fact that only through constant vigilance and timely effort may we hope to retain our comparative freedom from smallpox.

New Hampshire, for many years, has been fortunate in that the type of the disease in recent epidemics has been very mild. If we could only rest assured that it would manifest itself in the future in its mild type alone, smallpox would be robbed of much of the dread with which we now regard it. But such assurance cannot be ours.

California is now suffering from two distinct types; a mild one spoken of as alastrim, is the more prevalent, but a virulent one with many confluent and hemorrhagic cases and a high fatality rate also appears.

It is this fact, together with the associated one that physicians in New Hampshire have observed of late only the milder epidemics, that leads me to think that a brief résumé of a series of two hundred consecutive cases of a severer type may not be inopportune. They occurred in my service in the Kings County Hospital, Brooklyn, in the fall and winter of 1887-8. The eruption in eighty-three cases was discrete, with only one death, a feeble child of two years. Fifty-five had a semi-confluent eruption, three of the five who died being infants of four weeks, two months, and four months, none of whom had been vaccinated. Of the forty-seven confluent cases, nineteen died; while of fifteen hemorrhagic cases, including two of purpura variolosa, there were fourteen deaths. There were in all thirty-nine deaths, a mortality rate in this series of 19½%.

A few of these cases merit especial mention.

Mrs. M., age 24, was delivered at term on Dec. 1 of her fifth child. Dec. 2 she had very severe head- and backache and on the third the eruption, which became confluent, began to appear. She was extremely sick but eventually recovered. The baby did not contract the disease.

P. M., four months of age, was taken ill Dec. 14. About six months earlier this child's sister and several other inmates of the house had smallpox,

*Read at the Annual Meeting of the New Hampshire Medical Society, Manchester, May 29, 1929.

†For record and address of author see "This Week's Issue," page 698.

the mother, then seven months pregnant, escaping. There were no more cases in this house or its vicinity until the baby, who had never been vaccinated, became ill, and no other cases followed. The child died on the nineteenth. This case suggests the possibility of the existence of smallpox carriers.

Mary M., age five years, had a severe hemorrhage from the mouth and nose while being brought to the hospital. The eruption was hemorrhagic, the hemorrhage from the mouth recurred, and the child remained unconscious from the time of entrance to her death, two days later.

J. R., age 29 years, suffering from profound melancholia, was committed to an asylum for the insane. He gave a history of having had syphilis and of having taken large doses of iodides which had produced a profuse rash. On entering the asylum he was given a close examination, found to have a mild attack of smallpox, and sent to the hospital. He made an uneventful recovery and in due time was returned to the asylum.

J. M., age 63 years, gave a history of having had "black smallpox" in England when he was eight years old, and was very heavily pitted. This second attack was of a mild discrete type.

W. S., age 18 years, never vaccinated, was taken ill Jan. 17 and admitted on the twentieth. The skin of the face and chest was a deep purple. On the extremities the discoloration was less and patches of the ordinary eruption appeared. The purple hue darkened almost to a black and there were severe hemorrhages from the rectum and bladder. His temperature at no time exceeded 100°, and he retained consciousness until the end, three days after admission.

It was difficult in many cases to get the history as to vaccination owing to a lack of interpreters and to the fact that several patients were delirious or unconscious when admitted, but the following facts may be of interest. Of nineteen patients who, according to their evidence or that of their parents, had never been vaccinated, twelve, or 63%, died, while two others had severe confluent attacks. Of the thirty-nine cases which had a fatal termination, twelve had never been vaccinated; sixteen were adults who had not been vaccinated since childhood; one had been vaccinated nineteen years, one fourteen years, and one adult one week before the onset of the disease; two children had been vaccinated one week and one child four days before being taken ill; in the remaining five cases nothing relative to vaccination could be ascertained.

This experience may seem to you to be of the long ago, but just such an epidemic is liable to occur in this state at any time. In California, in 1926, there were 2794 cases with 236 deaths, a mortality of over 8%; in Colorado, in 1922, there were 1036 cases and 270 deaths, a mortality of 26%; and in New Hampshire, just so long as such conditions exist as were found in the schools of the village mentioned, so long as there remains the shadow of a doubt as to the constitutionality of the compulsory vaccination law, and so long as legislative bodies err as our state senate came so near doing, so long will the smallpox menace continue.

Discussion

Dr. Howard A. Streeter, Manchester: Any discussion of the paper just read except for the purpose of emphasis is superfluous and particularly so in a meeting of physicians who are familiar with the facts and who know the treatment necessary, to prevent smallpox. It is to be regretted that a few members of our profession because of misguidance or misinformation or mercenary reasons deny the value of preventive treatment in this disease.

So much misinformation concerning vaccination and preparation of vaccine virus has been circulated that it might not be amiss to consider briefly these two topics.

Vaccination however done, whether by single scratch, multiple scratches, multiple puncture or intradermally is a surgical procedure and should be treated as such. Whatever method is used, the vaccination area should not cover an area greater than 1/8 inch in diameter, and that is extremely important. Ordinarily a dressing is not required. Here is disputed ground. Studies made have proved that where no dressing is used or at most only a superficial dressing applied, the course of the vaccination is uncomplicated and in many instances the lesion will retain its natural covering without any open lesion. Any covering applied tightly over the scarified area whether on the arm or elsewhere, tends to restrict flow of blood when swelling occurs, and this is particularly marked when shields are used. Heat and moisture retained by dressings soften the vesicle and cause exudation of pus and serum which are retained under the dressing and by accumulation macerate the epithelium. This resulting condition provides favorable ground for growth of organisms which may and occasionally do cause serious complications.

Bunion and corn plasters have been used for vaccination dressings probably because the hole seemed to fit neatly over the scarified area. It did fit well but unfortunately for the patient not wisely. It is not necessary to recount the occurrence of tetanus following this procedure.

To sum up: the area to be scarified should be thoroughly cleansed, preferably with soap and water; pure, not denatured or adulterated alcohol, or ether; thoroughly dried; scarify through vaccine an area not greater than 1/8 inch in diameter; allow vaccine to dry in the air. If any dressing is used, it should be loosely applied and removed not later than the third day thereafter. A convenient and safe method of dressing is to pin or sew clean gauze or some other clean material on the under side of the sleeve over the vaccination area. This dressing can be easily changed when necessary. If the vaccination area is located elsewhere than on the arm, the physician's mechanical ingenuity may be taxed if he applies a dressing.

The purity of and methods of manufacturing vaccine are often questioned.

The best answer to the question of purity is that all vaccine must be approved by the U. S. Hygienic Laboratory before it can be offered for sale. All laboratories where vaccine is prepared are licensed by the U. S. Hygienic Laboratory. This license requires that procedure must be in accord with standard methods. Calves used are preferably white, must be healthy and this condition is determined by careful veterinary examination. The animal is carefully bathed and placed in a sterilized stall or stanchion and fed sterilized hay and pasteurized milk. The attendants must be healthy and must not attend any other animal. Before vaccination, the belly of the calf is thoroughly scrubbed and shaved. The vaccine is then applied in long scarifications extending the whole length of the belly. Following vaccination extra precaution is taken to prevent contamination. After the pustules are developed the exudate is carefully collected, aged, glycerinated, tested, put in tubes, and distributed.

The calf is killed and examined postmortem. If this postmortem examination reveals any abnormal condition or if during the vaccination period the animal reveals any undue rise of temperature or any other untoward symptoms, the vaccine is discarded.

After each third vaccination the stock vaccine is passed through a rabbit to reduce virulence.

This is only a brief outline of the process of preparing vaccine and necessarily omits some important details but is sufficiently comprehensive to outline precautions taken to insure a safe and potent preparation.

Dr. Charles A. Weaver, Manchester: In his paper Dr. Smith has covered the ground well as to the conditions of smallpox in New Hampshire and also the compulsory vaccination law for school children. If this law is enforced, I see no reason why we should have any epidemic of any size; but all the people of New Hampshire haven't been vaccinated. Many have migrated from a state or country where vaccination isn't required. You would be surprised perhaps at the number that are not vaccinated. Now we have got to take care of a condition. We are bound to get cases of smallpox, and the physician has a most important responsibility in the way of diagnosis or caring for those contacts by vaccination or isolation during the period of incubation.

Not many of the physicians have ever seen smallpox and they get their knowledge from text-books that describe only typical cases and that are not hard to diagnose, but when you come to make the differential diagnosis of a severe case of chickenpox and a modified case of smallpox, it is a different matter.

In 1885 there was an epidemic at Montreal. It continued for nine months and 369 persons died of smallpox. That epidemic started because somebody failed to diagnose the first case and called it chickenpox.

There is a difference. Chickenpox and smallpox have the same stage of incubation, and the eruption is similar, but one cannot go wholly by the eruption. I have been called to see a case where the eruption was produced by another condition. It was an eruption that might well be taken for smallpox but it didn't have that three-day period of fever, backache, etc. I looked for an exposure and I found the exposure was to a pox of a different size. I took her blood for examination and found it was four plus Wassermann.

In chickenpox there is one thing to be remembered: its eruption comes in groups. You will find patches coming and patches going so that you cannot be too hasty in your diagnosis.

In this State since February of this year we have had 15 cases of smallpox; two of them are now active. It has been my privilege to have seen ten of those cases that I might aid in the diagnosis. Three of those 15 cases were confluent, the rest were discrete, mild. One of them was very mild, and you will pardon me if I give a history of this case. The history is this:—the woman was taken sick in a hospital in an adjoining State and she had backache, headache, fever running from 103 to 104, and the diagnosis at the hospital was pelvic abscess. On the third day the fever subsided, and on the fourth day she came 150 miles to New Hampshire. She noticed a little eruption on her face, and ladies are very particular with respect to any eruption on the face, and she immediately called a physician. She was isolated and I found less than twelve papules on the face and hands, but the history was enough to hold that case, and in two weeks afterwards a typical case developed. That was a case of contact that was overlooked; and to come down to the time allowance I wish to say that physicians should be very cautious of any case of eruption following a three-day period of headache and backache with fever. At the time of eruption the fever usually subsides. They should also be cautious of any eruption and isolate such patients and see what develops, especially in the case of a child who has convulsions.

They should always keep in mind the stages in the development of smallpox—that is, fever, papular stage and pustular stage. The physician should play safe.

Dr. J. W. Tappan, Derry: I heard Dr. Streeter say that you should not put a dressing on the vaccination. Now I have always been in the habit of putting a light dressing on the vaccination, taking a square of gauze under sterile conditions and cutting a hole in it after the vaccine had dried and applying adhesive plaster; not so much for the sake of keeping it clean as a dressing but to keep the child's finger nails away from it when it begins to itch. I have

vaccinated many children and old people and used to vaccinate all the Pullman porters in Washington and I have never had any bad results from putting such a piece of gauze over the vaccination.

As to the enforcement of the vaccination laws—I was examining some of the children in my neighborhood and I found a boy who had no vaccination scar and I reported him as being unvaccinated and the health officer excluded that boy from the school and the chairman of the school board, because there was some discussion by the parents, told the boy to go back because there would be too much fuss made.

Dr. Charles A. Weaver, Manchester: Of the 15 cases I had, only two had been vaccinated; one 40 years before and the other two weeks before. The vaccination was working. I read that the vaccination did modify the disease.

Here is a point—if you want to modify the disease, you can't expect to 72 hours after the disease has started: it might modify the disease, but I don't think you get immunity.

DISCUSSION OF "THE FUTURE OF RURAL MEDICINE"*

By John P. Bowler, M.D., F.A.C.S.

Dr. H. O. Smith, Hudson: Various phases of this subject have been ably presented to you in the past few years: By Dr. Lord in a very thorough and painstaking paper, by Dr. Wilkins in two reports of the committee on the distribution of physicians, by Dr. Clow in a paper read at a meeting of the county secretaries and recently printed in the New England Journal of Medicine, in the presidential address of Dr. Fitch, a year ago, and now in the very interesting and suggestive paper to which we have just listened.

Yet there is always something more which may be said and some new point of approach. I have followed with interest some of the recent work of the Duke Endowment in North Carolina, a state with medical problems something similar to those which are demanding a solution here in New Hampshire. The trustees of the Endowment claim to know both the cause of and the remedy for the unsatisfactory conditions which Dr. Bowler has discussed. In a paper read before the Congress on Medical Education, in February of this year, the director of the Endowment, Dr. Rankin, after stating that every medical school, teacher, and journal is teaching that modern medicine cannot be practiced without the facilities that are to be found in the hospitals, says "All of which explains the shift, both quantitatively and qualitatively, of the many and the better physicians from rural practices to city practices. The hospital is the magnetic force that has depleted rural areas and crowded urban centers with physicians."

Believing this to be the cause of the existing dislocation of medical services the Duke Endowment is expending a million dollars a year in the construction and operation of hospitals in the Carolinas.

Dr. Rankin further expresses his belief that "the small local hospital will prove in itself to be a sufficient cure for the condition we are considering." In a personal letter to me the doctor says that when the plan of the Endowment is developed to its maturity ninety per cent. of the physicians will be within ten miles, or within twenty minutes' drive of an accessible hospital. Right here I think he begs the entire question. It is precisely in the towns that are or should be served by this remaining ten per cent. that our most serious problem presents itself.

Personally, I do not feel that Dr. Rankin's remedy is so all-sufficient as he deems it to be. At its best it calls for a generous sprinkling of endowed hospitals and New Hampshire has no Duke in sight to provide this endowment. I believe that no solution has yet been offered which will solve all the problems. The establishment of medical schools in the smaller educational centres, as outlined by Dr. Bowler, will certainly provide a measure of relief. A subsidy given by the town may work satisfactorily in some instances. The oft-mooted plan of free tuition, in return for which medical service will be given at some designated point for a certain length of time, may yet prove of value. A certain town in Maine is most fortunate in that its medical practitioners have been provided with a remedy for that professional detachment and consequent inadequacy which Dr. Bowler deplores. A large sum of money has been placed in trust and every few years each physician receives from its income an amount amply sufficient to finance a three months' course of study at some leading medical center. But, after all that has been suggested has been accomplished, I think a need will still exist for men animated largely by the desire for service and imbued with the spirit which has enabled Sir Wilfred Grenfell to cope with difficulties far greater than are to be found in any region in New Hampshire.

Dr. William H. Leith, Lancaster: It is a pleasure to discuss a paper of such merit as Dean Bowler has presented. The menace to the rural community because of the departure of the doctor from the crossroads has not been overdrawn.

In many instances rural medical service has improved by modern methods of communication and transportation but this is not universally true. The problems of affording medical attendance to the bread-winners of the family, to the expectant mother and the sick child residing

*Published in the issue of June 6, 1929, page 1199.

in the remote neighborhoods, is still ours and the city and large town doctor is meeting the situation none too cheerfully when he is called upon to sacrifice his personal comfort.

Harvard Medical School made the announcement more than twenty-five years ago that she was not educating doctors for the crossroads; this disposition together with the enforced retirement of many smaller colleges from the field has well-nigh brought about the extinction of the country practitioner. Having experienced for nearly a half century all phases of a practice extending into the backwoods from a more populous center before and since the hospitalization of the towns perhaps I might more appropriately discuss rural medicine of the past instead of the future but I am not living in the past although I may be of it.

I was glad to hear Dr. Bowler say that the rural doctor need never have been portrayed as a victim of self-pity or suffering from voluntary or involuntary martyrdom. On the contrary he has always regarded with commiseration his urban brother who could not enjoy the beauties of a New England countryside from an open buggy wagon for eighteen or twenty hours out of each twenty-four and because he was denied the opportunity of acquiring the skill of the doctor at the crossroads in doing a podalic version or extracting himself from April mud and February snowdrifts with equal facility.

I am fully in accord with what has been said about subsidizing the rural practitioner. Its futility has been amply demonstrated. A proprietary interest in the local doctor however acquired is destructive to his best efforts and the necessary appreciation of the recipient of his services.

Neither does the remedy of restoration lie in abbreviation of the curriculum. Neither can there be dedicated to the doctor for the crossroads a sub-standard diploma. Doctors can never be too good and however well qualified there always remains the possibility of sacrificing the few for the saving of the mass,—or the danger of repeating the blunders of his predecessors.

I believe with the author that there is a place for rural schools, that men who prefer a country practice, and there are such, will from choice attend those schools. I am not entirely in sympathy with the author's conception of the dangers of isolation. To the man who loves his vocation, who has the qualities of mind and heart that endear him to those whom he serves, who is willing to find his pleasure in his work, there can be no isolation. Let him cultivate friendly and reciprocal relations with men of larger opportunities in the not too remote medical centers from his field, and his patients with the knowledge of his desire and willingness to share responsibility will co-öperate, and instead of passing his door will stop at it.

I had pictured as a measure of relief a rural health service with a small infirmary and a public health nurse functioning as the active force and intermediary between town and country; with an organized out-patient plan such as the author has outlined; with rotation of service if need be, much could be accomplished by the urban and large town profession. The suggestion should receive the serious thought and action of this society.

A sad part of the present situation is the unwillingness of the large town doctor to deprive himself of the luxuries which he enjoys in answering calls into the country. A club coöperation in every large town along the lines suggested would entail no particular hardship on individual members.

I hope I may see the doctor restored to the crossroads. I wish we might see medical education restored in New Hampshire. In closing my inadequate discussion of this most excellent paper, permit me to say that my activities began when the old time family doctors filled these front seats, the greater number educated at Dartmouth College. I knew them and was associated with them intimately.

In the archives of this society there are the records of their activities and achievements; men of remarkable personalities; men whose skill when measured by their opportunities will never be excelled. The village doctor did the work of his time and did it well. His fame did not always extend but he was loved by the children, all of whom knew and spoke to him; he had the confidence and affection of their elders. He set us the example of not always measuring his compensation in terms of denomination. To me his comradeship and example were inspiring. His memory is a benediction.

Dr. Louis W. Flanders, Dover: It has certainly been a great pleasure to listen to Dr. Leith, my old friend of forty years, who has just spoken. He knows rural medicine if anybody knows it.

I have had an interesting correspondence this winter with a country doctor in Vermont. He has presented the matter of country practice to me very vividly. He writes that everybody strives to cultivate in him a feeling of inferiority complex. His patients think he cannot know as much as his brethren in the larger towns; his brothers in larger communities believe the same thing and broadcast it. During the winter, and when the mud is deep, he is a good enough doctor for his townspeople, but as soon as summer comes, they leave him for doctors in larger places.

Can you not conceive that a man constantly belittled by his patients and by his brother physicians, might come in time to lose confidence in himself?

Young men will not settle in the country today because there are no hospital advantages, no nurses, no modern conveniences. Replying to this, I have heard it said on this floor that

hospitals are within two hours' reach of any of the small towns. But if a young man takes his patients there, can he treat them himself? Not unless they are rich enough to hire a private room. The poorer patients are left to the staff.

When a young man considering practice in the country finds that he will have no standing with the laity, no standing with physicians in larger places, no opportunities for hospital practice—do you wonder that he hesitates? Remove these obstacles and the man just out of college will be willing to come to the country to practice.

Dr. Dean Lewis, Baltimore: I have been listening with a great deal of interest to the discussion on the rural doctor. In the first place he can't be distributed for every one is going to select his own place to live. I think medical schools are responsible for the lack of rural physicians. We commenced to rely upon instruments of precision, and rural medicine has not been taught. If you read the book by Sir James Mackenzie, you will find some interesting things. He graduated from Edinburgh, and went to work with an old doctor who knew the face of disease. One of the greatest regrets of Mackenzie's life was what he got in introducing the polygraph and seeing men use his polygraph and make the diagnosis of heart disease without seeing the patient.

When he established his office in London at 54 years of age all these instruments of precision disappeared. He also made the diagnosis of heart disease on a patient because the man had dyspnea on exertion, and this man was dissatisfied and went to Germany and had x-rays but he came back to England and died of angina, but Mackenzie said he knew it.

Now a man cannot compete in a rural district because he cannot buy these instruments, and the medical profession has been taught that they were absolutely necessary. I think all these things should be taught, but I think also that clinical medicine and surgery should be taught and that they ought to recognize disease because they see it repeatedly, and when we teach clinical medicine and surgery, the rural physician will reappear because he is a clinical physician.

Dr. George V. Fiske, Manchester: It seems to me that this discussion of putting the man back in the country has been marked. Until you take the man from the country and give him an opportunity to get a medical education, you will never put him back into the country. The man who has a thousand dollars at his command and all the privileges of the great white way will never go back to Northwood. But you take a man from Northwood and give him an education and he will gravitate back to that place. Professor Wrenn in Boston recited to me that the economic position was entirely wrong. Nine years to prepare for a life work is too long. A man can go to a law school and take three years and be admitted to the bar.

In regard to this matter of putting young men back or doctors back into the rural communities, you have got to have your material from the rural communities first to get them to gravitate back to such places; and if we could organize a college and disregard the A. M. A. dictum that it must be a Grade A college, and if you could get a college where they would not require so much money to obtain an education, you would get them going back to the country places.

Dr. John P. Bowler, Hanover: I do not think I can add anything to the discussion which has gone beyond anything I had expected. There is one point which came up in Dr. Smith's discussion which is the implication that the only solution of this problem was to be money—I think that is a mistake. We all can't have a Duke; and yet I think that is not the obstacle. I do not think we need a Duke Foundation.

The other point I want to go back to is relative to what Doctor Lewis brought out speaking of equipment. It is a fact that the patient in the country who sees a physician who has not a whole lot of it thinks he is no good and he goes to a hospital or to somebody else who has that equipment. I think the answer to that will be found in well-equipped groups which can be developed, and this custom will prevail—I have no question about it. I have a question as to the time but I have not any as to the fact and its allowance of men in a group. If a group is composed of only three men, they carry in their overhead things that any one of them alone could not carry.

MISCELLANY

ANNUAL MEETING

The 139th annual meeting will be held Tuesday and Wednesday, May 20-21, 1930, at Concord.

The House of Delegates will have its first meeting Monday evening, May 19.

D. C. Sullivan, *Secretary-Treasurer.*

NEW MEMBERS

Garifalos J. Kapopoulos, 795 Elm Street, Manchester, N. H.

Carl R. Friborg, 738 Hall Street, Manchester, N. H.

NEWS ITEM

Dr. and Mrs. Charles L. Curtiss of Redlands, California, and formerly of Manchester, N. H., have travelled East by motor car and have been visiting friends in Manchester, N. H., and New Haven, Conn.

DEATHS

Dr. Hannibal Hamlin Bryant of Gorham died September 12 at his home of pneumonia.

Dr. Charles John Morrison of Colebrook was killed in an automobile accident July 3.

THE NEW HAMPSHIRE SURGICAL CLUB

STERILITY*

BY GEORGE F. DWINELL, M.D.†

THERE have been so many splendid articles on the various phases of sterility in the journals lately, that I am somewhat abashed to present this paper today. However, I believe it will be worth while to stimulate a little interest in this society and to show what we are doing in Manchester for our sterility cases.

My interest was aroused by the desire on the part of Dr. Burpee and one or two others for someone in Manchester to take up this important work seriously. I started about three years ago with necessarily small beginnings and soon found that I was confronted with real problems. Surgeons generally were content to advise dilatation and curettage and many such operations were performed, and still are without any knowledge as to the condition of the husband or other factors.

This, of course, is not a fair proposition, because, we know that the male is to blame in about half the cases.

It isn't in the scope of this paper to give a long dissertation on the causes of sterility. Meaker of Boston gave an excellent working classification showing about forty different causes. He also showed the absolute necessity of having a definite routine in handling these cases and he is very fortunate in being able to develop such a good clinic.

Perhaps the best way for me to present the subject would be to tell you my routine and then dilate on some of the more outstanding features as I go along. My first interview is usually with the woman, and I try to tell her in understandable language what a complex affair sterility is and just what steps we have to take to make a diagnosis and prognosis. Then I take a very careful history of her family, past and present health with a detailed account of her coital relations. This latter is checked up later with the husband who often tells quite a different story.

At this interview I do a complete general physical examination and a careful vaginal examination. This is extremely important because we know that many of the cases of relative sterility are due to constitutional diseases, malnutrition and metabolic disturbances. During the pelvic examination obvious defects can be spotted at once and later checked up.

At the second interview the woman is instructed to appear at my office one hour after intercourse. This postcoital examination is one of the best tests that we have, because if we find normal active spermatozoa in the cervical canal in proper numbers, we know that in all probability the man is fertile and that the woman's secretions are not hostile to the spermatozoa. On the other hand, if we find dead or only feebly active spermatozoa we must have a condom specimen to find out the man's true condition.

The man's history and physical examination can be done at any convenient time and should be just as thorough as those of the woman.

The next step is to determine the patency of the Fallopian tubes. This test, developed by Rubin originally and later modified by himself and other workers marks a big advance in our ideas. Personally, I have used these simple glass tubes invented by Ferguson and have never had any trouble from them. I use air in very small amounts. This test is done in the office and takes very little time. It should never be done in the presence of infection, bleeding, or amenorrhea where pregnancy cannot be ruled out. We should never use more than a pressure of 200 mm Hg. The sudden drop in pressure when air goes in and the hissing sound heard with a stethoscope are indications of open tubes especially if there is shoulder pain, when they assume an upright position. This indicates air under the diaphragm.

If no air goes through at the first examination, I repeat the test on another day following the use of atropine. Kennedy, Meaker and others have demonstrated a condition called isthmospasm which can be relieved by atropine or benzyl benzoate.

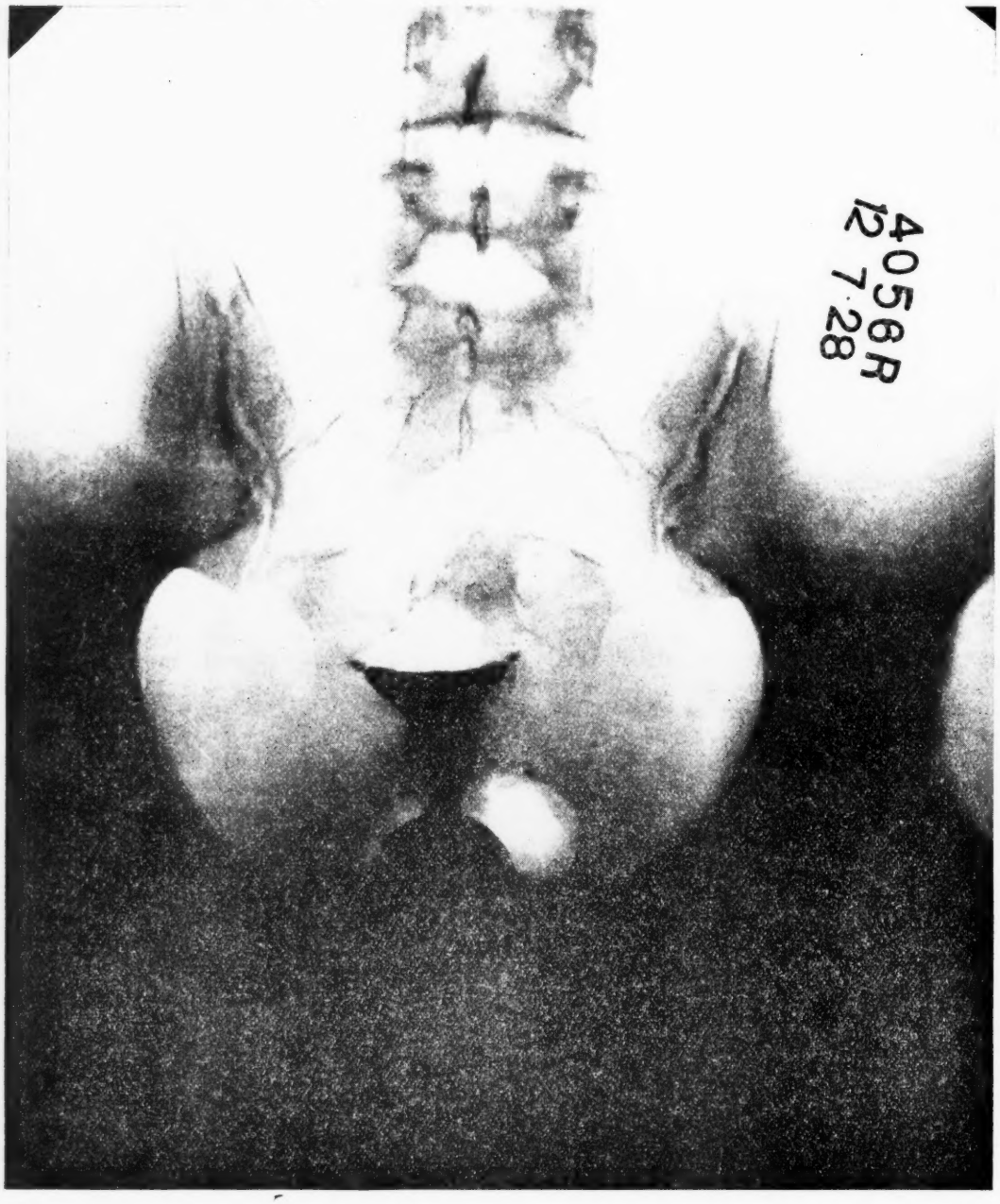
I have met this phenomenon several times and in two of the cases pregnancy followed the therapeutic use of atropine before coitus.

If no air enters at this test I usually have x-rays taken following the injection of lipiodol into the uterine cavity. This can be done with any syringe and tube with a guard to stop leakage from the cervix, but I have found this special apparatus very convenient. It can be obtained through Fougera. Dr. Merrill has some very excellent slides to show you. These demonstrate normal tubes, closed tubes, one tube open and one closed, etc., to give you an idea of the possibilities of this method.

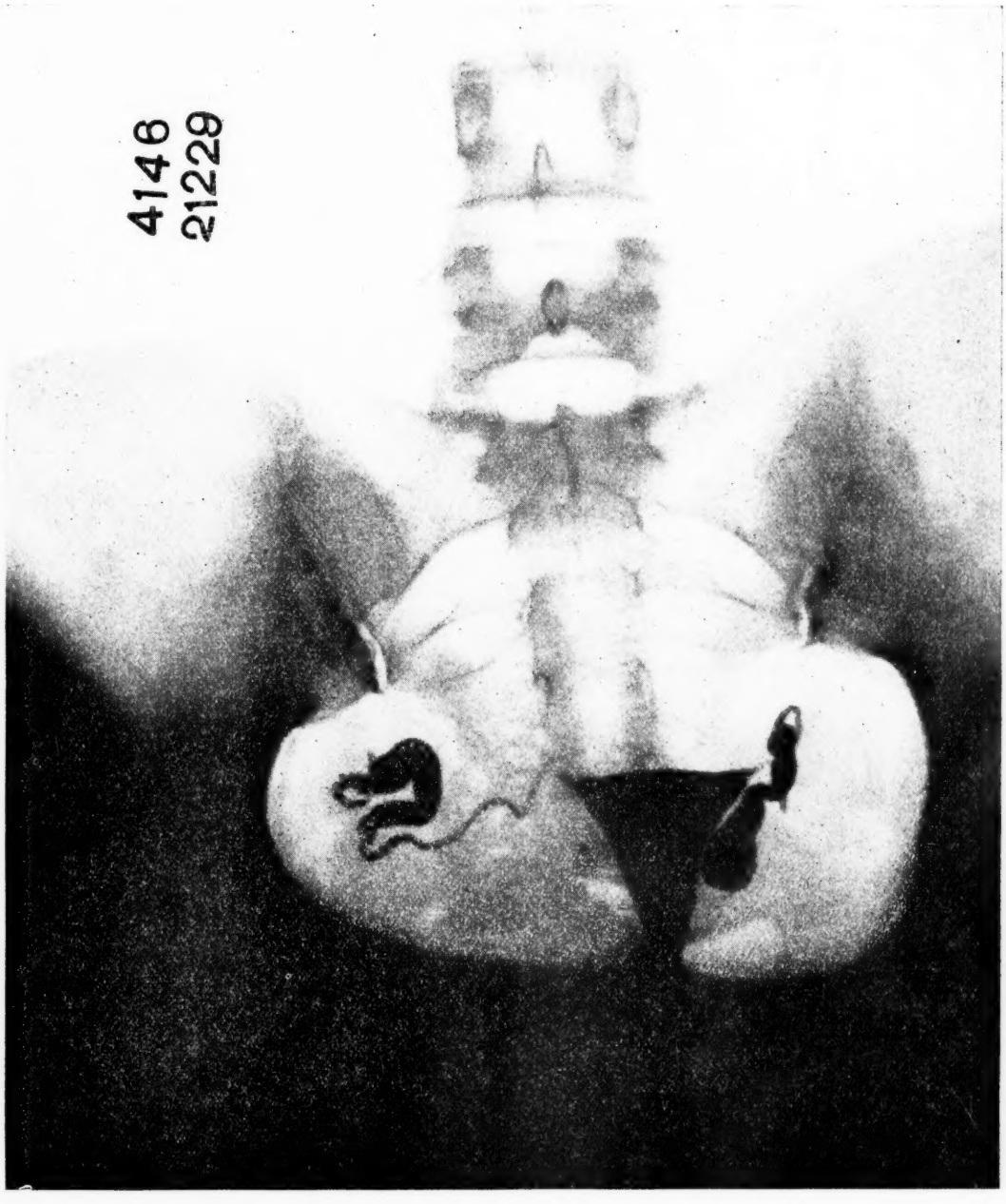
By these various tests we can demonstrate any failure of the spermatozoa to reach the tubes and any obstruction that would prevent the ova from meeting the spermatozoa. But, when we have determined these points we come to an impassé, because we have no method of demonstrating the ova or the process of ovulation except by inference. Here the history of the

*Read at the Semi-Annual Meeting of the New Hampshire Surgical Club, May 1, 1929.
X-ray observations by A. S. Merrill, M.D

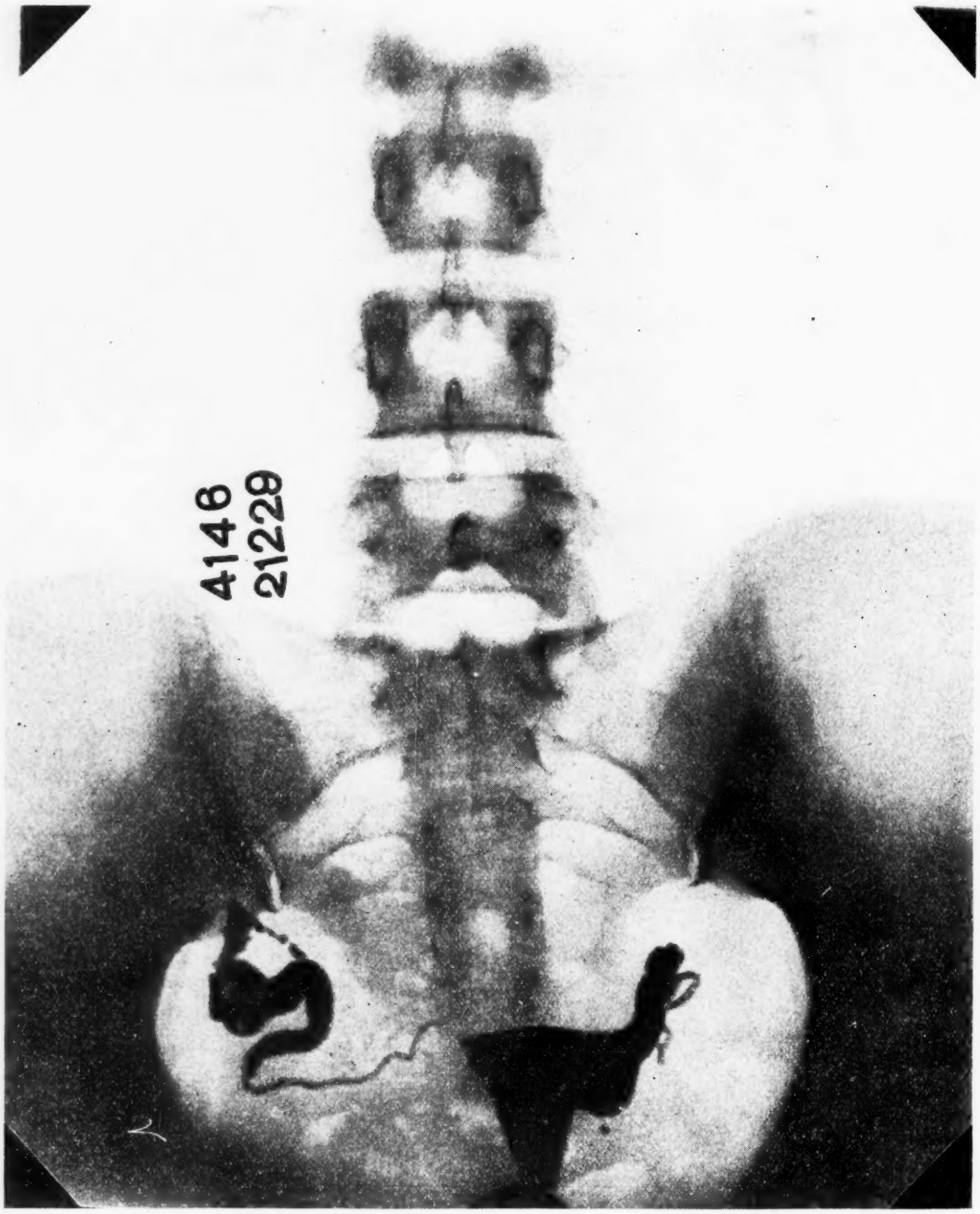
†For record and address of author see "This Week's Issue," page 698.



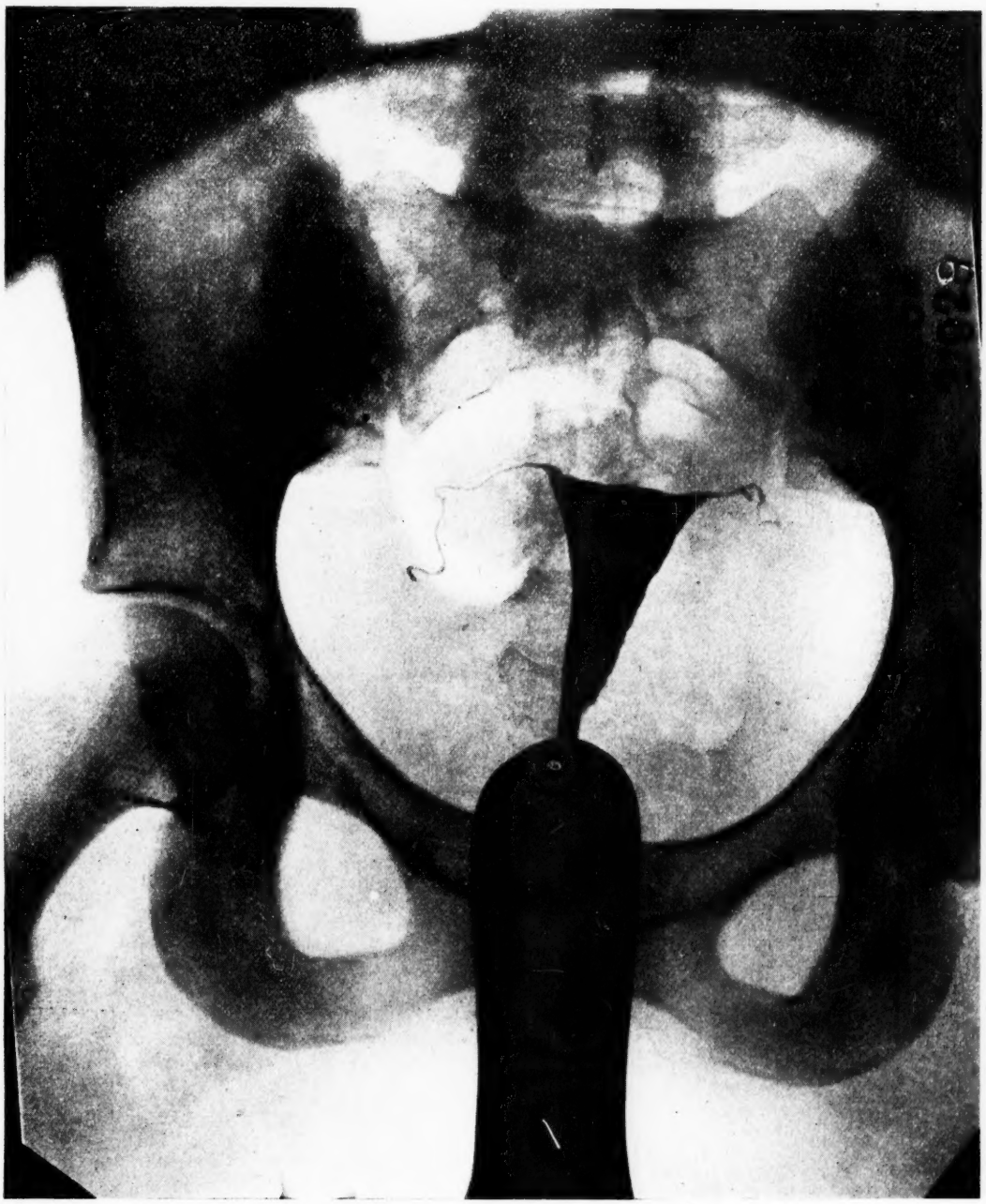
1. Both tubes obstructed. Shows that no lipiodol passed through either tube during the course of the examination



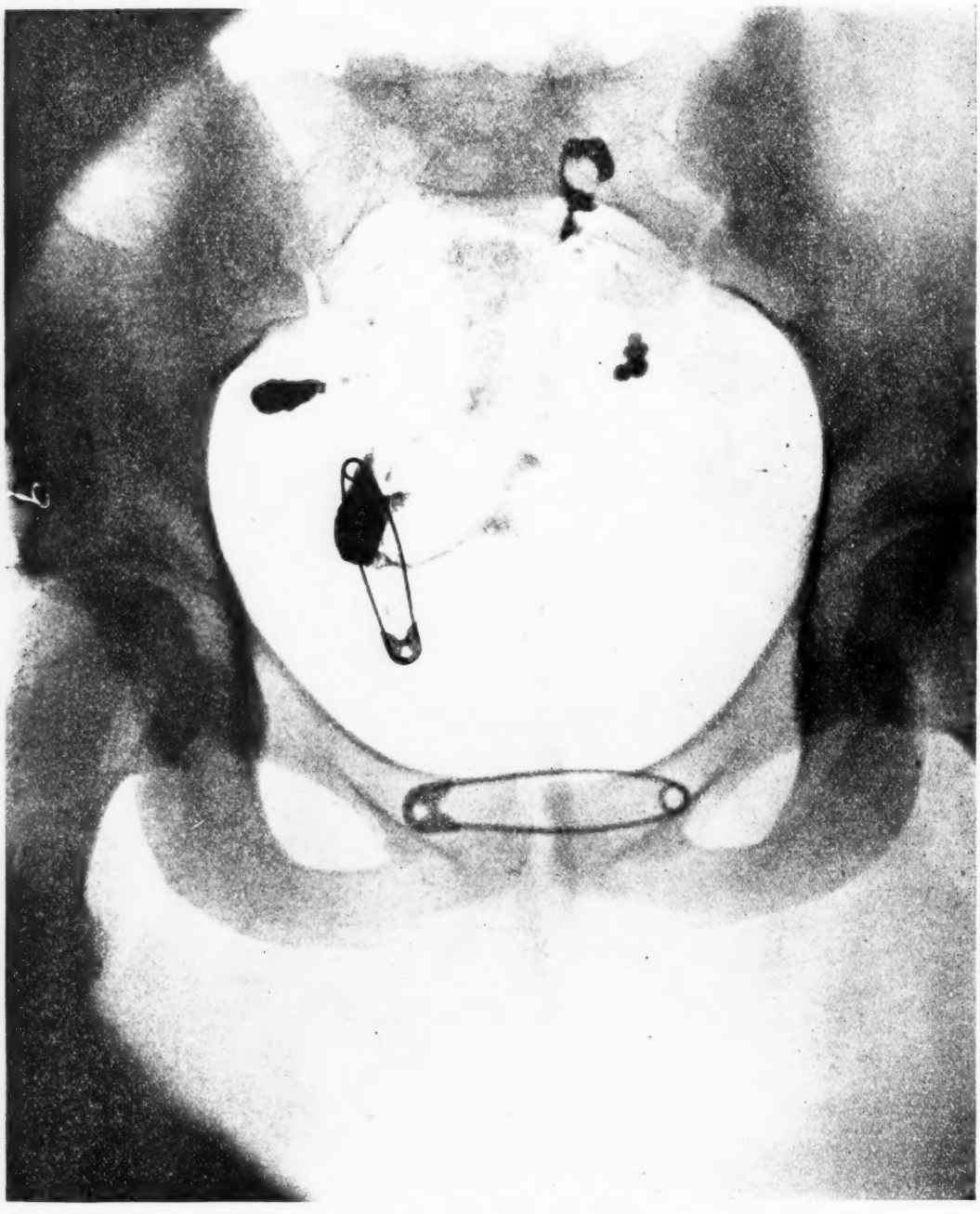
2 a. One tube obstructed. One year after ruptured extrauterine pregnancy without operation shows no escape of lipiodol from right tube. Left tube normal.



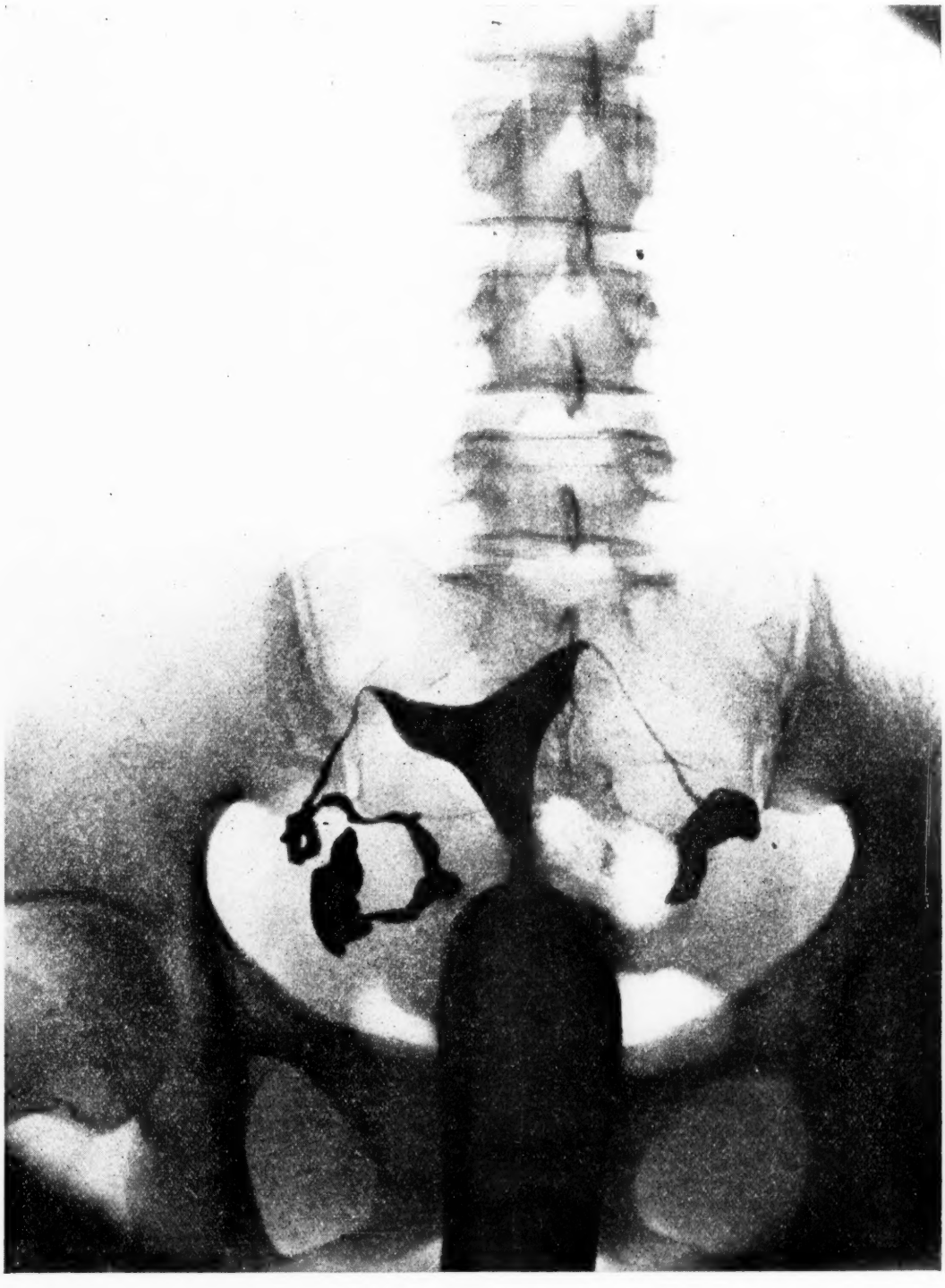
2 b. One tube obstructed. Twenty minutes later shows blocked right tube. Same as 2 a. (Print reversed.)



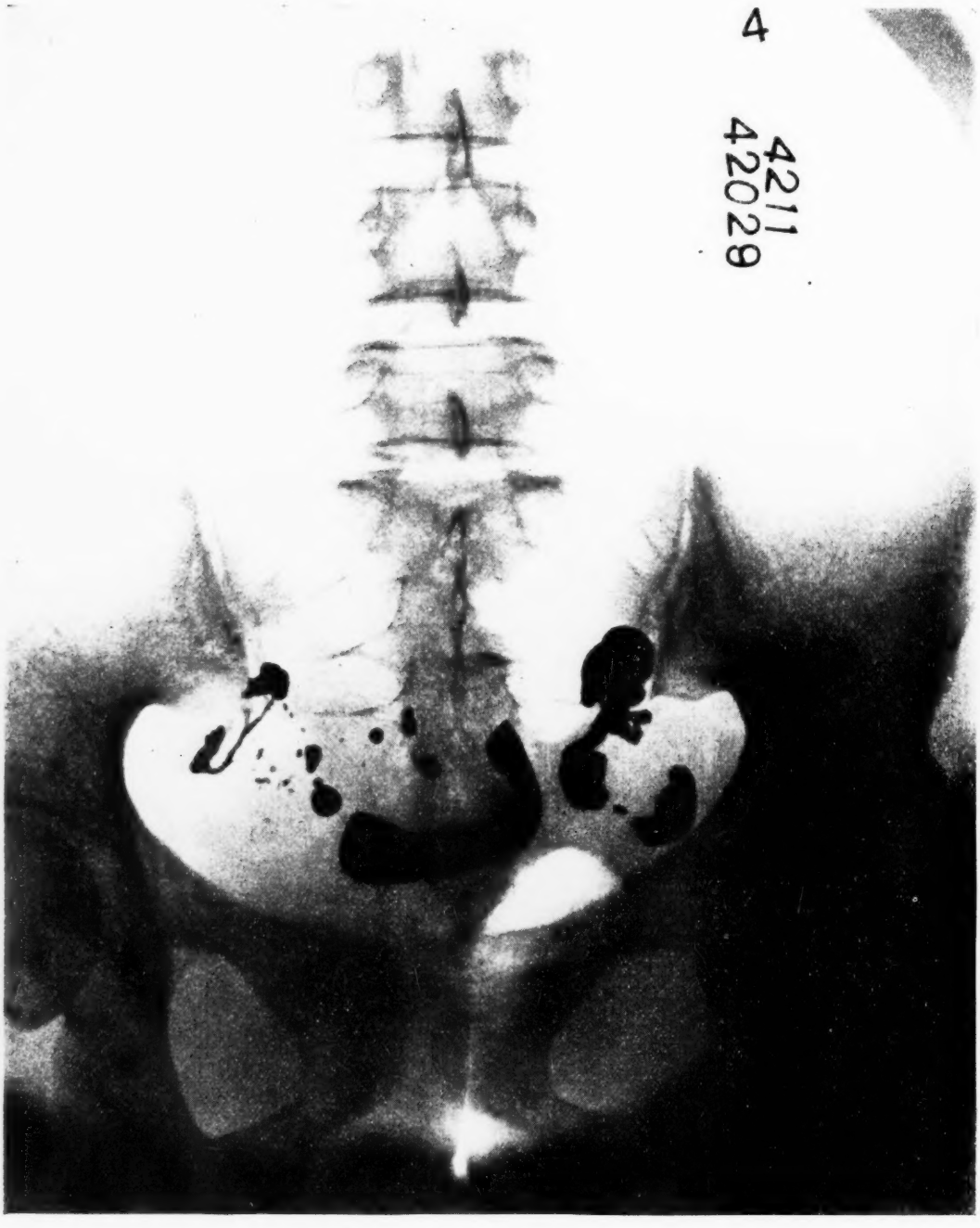
3 a. Normal tubes. Immediately after injection shows both tubes patent.



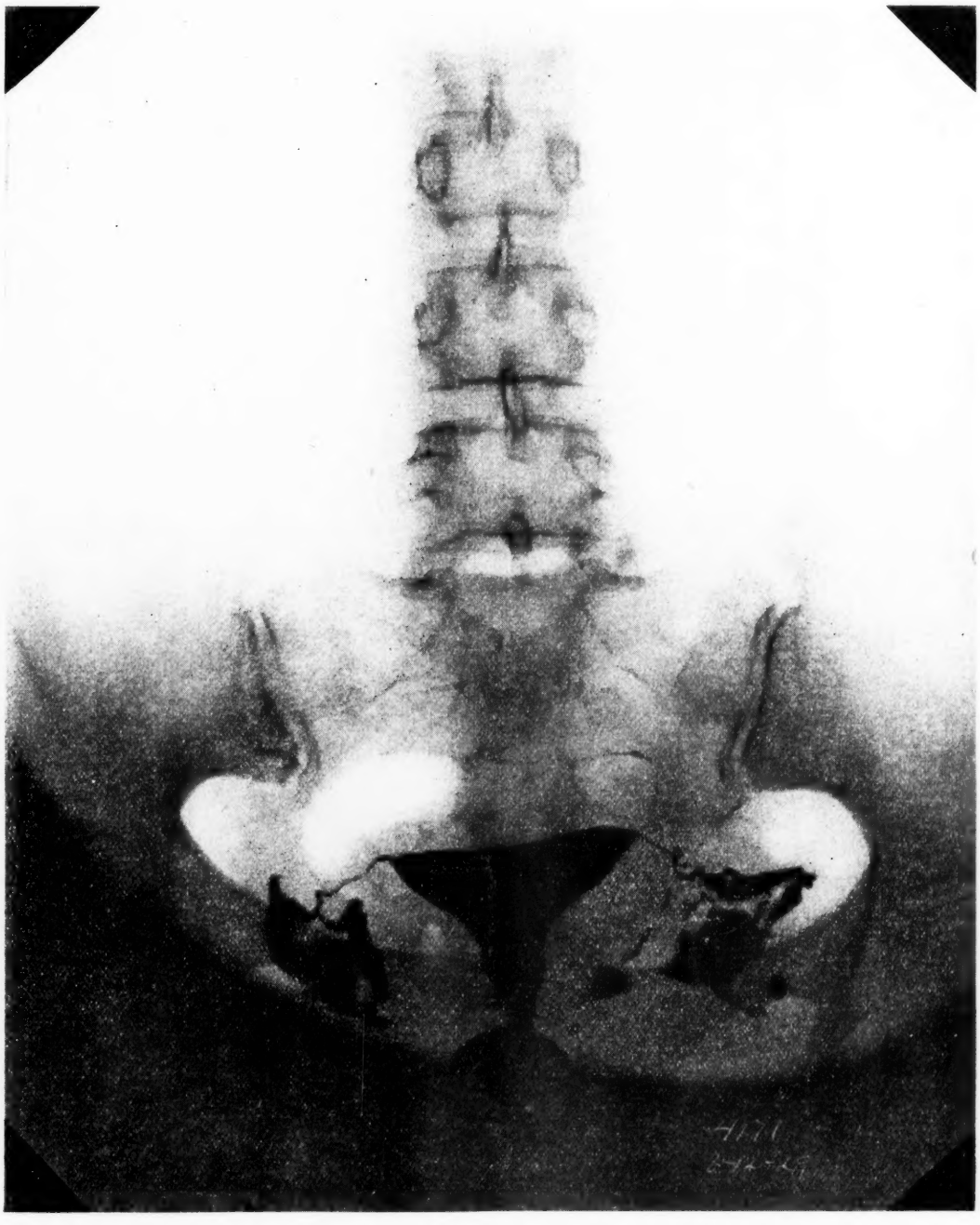
3 b. Normal tubes. One hour later shows that all of the lipiodol has passed into the abdominal cavity. Same as 3 a.



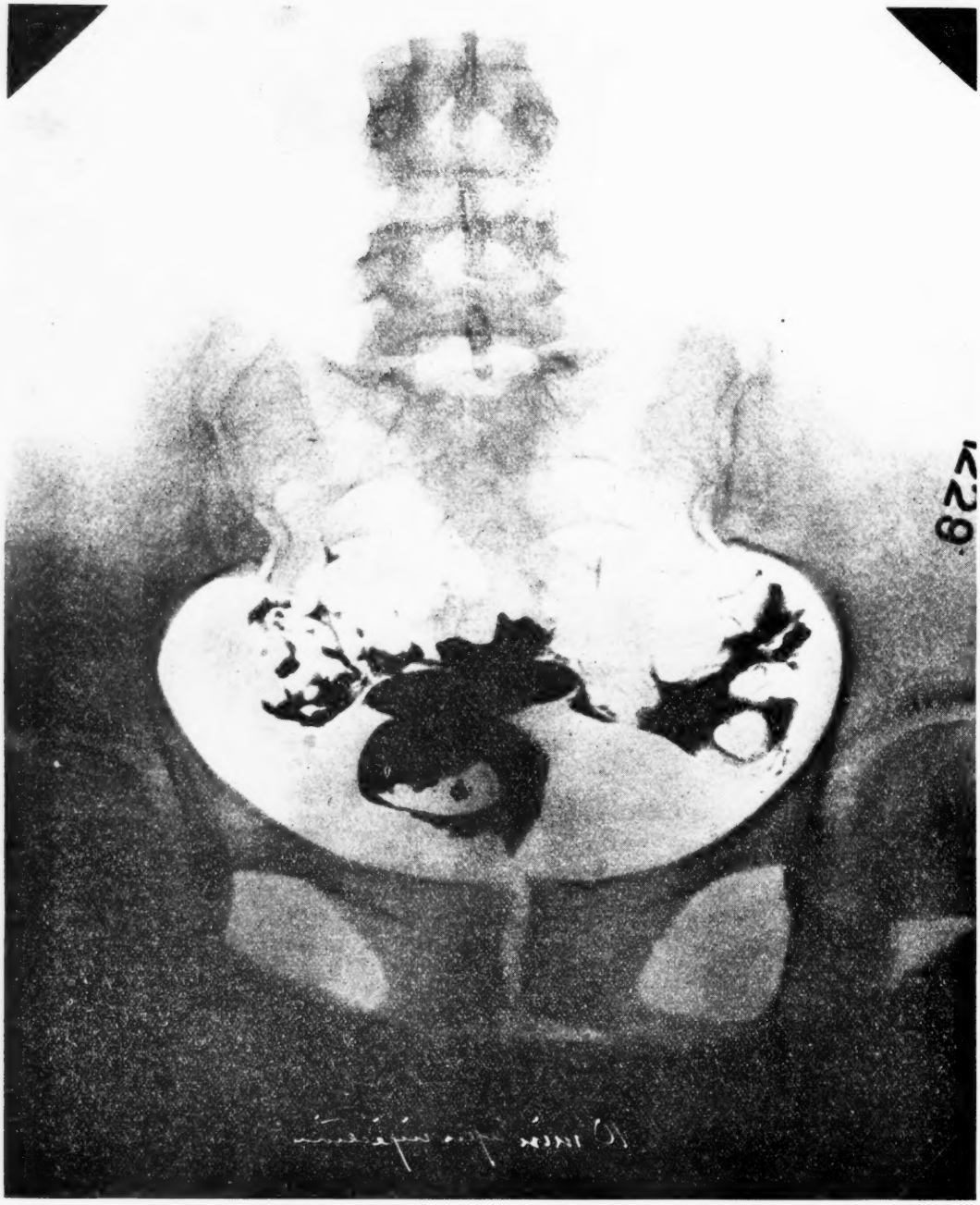
4 a. Normal tubes. Isthmo spasm. Immediately after injection showing both tubes well filled—after atropine. By air insufflation—no air entered at 200 mm. pressure—After ingestion of atropine, air entered at 80 mm. pressure.



4 b. Normal tubes. Isthmo spasm. Ten minutes after injection showing escape of lipiodol into abdomen. Same as 4 a.



5 a. Normal tubes. Immediately after injection shows lipiodol already seeping into peritoneal cavity.



5 b. Normal tubes. Ten minutes after injection showing lipiodol free in abdominal cavity. Same as 5 a.

catamenia and possibly metabolism tests, where indicated, may give us a clue as to the presence of thickened capsule, retention cysts or corpus luteum cysts.

Beyond this point we reach the large number of cases of relative infertility. These may be due to the mating of two people of low fertility or to temporary impairment of the fertility of one or both, due to constitutional defects, metabolic disorders or endocrine disturbances. These cases offer us a considerable problem, but when we recognize their existence by a process of elimination and careful examination, we are often enabled to help them. I have one family in which both members are definitely subthyroid, the man following a thyroidectomy and the woman from unknown causes. The judicious use of thyroid-extract restored catamenia after an absence of eighteen months. In another woman who had had amenorrhea for nine months, thyroid extract restored her periods and she later had a miscarriage at three months.

Diet and rest and exercise play an important part in some of these cases in which we find very little reason for sterility in our examinations. In these cases the probable cause is lack of vitamines and a poorly balanced diet. As we know more about vitamines and their sources we are able to prescribe an easily followed diet which may be expected to give results in certain cases.

What we can do for sterility cases, of course, depends on our findings. Many of the male cases can be restored to fertility by proper treatment at the hands of good genito urinary surgeons. Many must be treated by internists for serious constitutional diseases. The gynaecologist can help by dilatations, discissions of the cervix, replacements of the uterus, etc., when these operations are indicated, but the indications are all too few. Operations upon the ovaries may be needed for cysts and thickened capsule.

As to operations upon the tubes there is beginning to appear evidence that we may now expect some results, because, with insufflation and lipiodol injections, we have a means of following up these plastics and probably preventing their closure. Schmitz of Chicago recently wrote a review of the literature on this subject in the journal of *Surgery, Gynaecology and Obstetrics*. His opinion is that an operation to restore the lumen of the tube, or, in the absence of tubes, to transpose the ovary into the uterine cavity or cornu is indicated when a patient with a potent husband desires offspring.

Personally, I have not advised or done this as yet, but I believe, from his statistics, that I shall in the future when occasion arises, because even 8% of cures in these cases is distinctly worth while.

To summarize: I have tried to show the necessity of a careful routine in the examination of these cases. (2) That no examination is complete without a knowledge of the patency of the tubes and of the potency of the husband. (3) That the outlook for plastic operations on the tubes is probably much more favorable since the use of insufflation and lipiodol injections as follow-ups.

PREVENTION OF SUNLIGHT STARVATION

Scientists are taking steps to prevent future generations from "sunlight starvation", it was disclosed during the symposium on ultraviolet radiation which marked the close of the 23rd annual convention of the Illuminating Engineering Society, in session in Philadelphia. The concentration of population in large cities and industrial centers and the fact that murky atmospheres and indoor jobs tend to reduce greatly the amount of beneficial sunlight received by individuals are given as reasons for inaugurating preventive measures.

Whether man will ever become acclimated to the amount and character of light he now receives is of academic interest only, according to C. E. Greider and A. C. Downes of the Research Laboratories, National Carbon Company. For the present generation, the most satisfactory solution of the problem of sunlight starvation would be the use of an artificial light source which duplicates sunlight in both ultraviolet, visible and infra-red, it was pointed out. There exist wide variations as to the quality and quantity of sunlight. For purposes of comparison, further research is to be conducted in an effort to determine a "normal" sunlight and one which meets the requirements of man.

One's body must not acquire a coppery veneer to derive the full benefit of sunlight. In fact the curative qualities of sunlight decrease with each additional coat of tan, according to Henry Phelps Gage, chief of the Optical Division of the Corning Glass Works. He said that when burning or tanning occurs the time necessary for subsequent irradiations must be increased, to say nothing of the discomfort which accompanies burning. The coat of tan tends to prevent overdosage, however.

Sunlight will not only improve general health but will also produce changes in blood circulation beneficial for aches, sprains, bruises and various types of pains. This is due to the deep-penetrating qualities of the infra-red rays, Dr. Gage said. Sunshine promotes the growth of bone and teeth in infants and growing children, lessens the danger of spasms due to lack of calcium in the blood and reduces the number and severity of colds. Benefits which may be hoped for when exposures to sunlight are carried out under the direction of a physician include great improvement or cure of all forms of extra-pulmonary tuberculosis, improvement in some forms of pulmonary tuberculosis and possible advantages in cases of pernicious anemia, according to Dr. Gage.

W. W. Coblentz, physicist of the Bureau of Standards, also a party to the symposium, declared that rapid progress has been made during the past year in the commercial production of window glasses that are highly transparent to the short-wave-length ultraviolet solar radiation. Still more research is necessary in this field, he said, particularly as regards the minimum transmission of various types of glass necessary to produce biological results.

The use of glass depends largely upon the location, according to Dr. Coblentz. General observation indicates that glass of high transparency will be required in high altitudes, while in localities where sunshine is abundant a glass having an inferior ultraviolet transmission may prove satisfactory.

ADDRESS DELIVERED AT THE DEDICATION OF THE ROXBURY HEALTH UNIT*

BY CHARLES F. WILINSKY, M.D.†

RICH indeed in noble tradition is the art of the science of medicine. It is as old as history itself and its pages are filled with much evidence of great devotion and supreme sacrifice. Quietly, unobtrusively and without the stimuli of the blare of the trumpet, the flash of cymbals and the beat of the drum; without the reaction of passion to the gleam of the sword, unsung heroes have given their lives that disease might be conquered and life extended.

Evidence of public health knowledge and ideals comes to us from the days of ancient Greece and Rome. The Grecian conception of personal hygiene with particular emphasis on the care of the body has never been improved upon. Rome presents evidence today of keen interest thousands of years ago in sanitary improvement. As in everything else, the public health pendulum has swung backwards and forwards through the dark ages to the days of the great sanitary awakening. Prison reform in England, the release from bondage of the child in employment, improvement of general sanitary conditions in many parts of Europe were evidences of keen minds thinking in terms of better health.

The immortal Pasteur with his discovery of the germ theory of disease opened up to the world countless possibilities for specific disease control which Science grasped eagerly to her breast and from which blessing and boon, humanity has reaped such rich dividends. The romance of medicine as an art and science really dates back from the precious revelations of Pasteur. Preventive medicine may be aptly regarded as the natural result of research and may be aptly regarded as the proudest achievement of modern civilization. It has obviously proved itself to be the outpost of civilization and has been positively inter-related with economic progress. The control of yellow fever, cholera, malaria, smallpox, typhoid fever, diphtheria, tuberculosis and other diseases has been in a marked measure, dependent upon the application of modern public health knowledge. The intelligence of communities as a whole may be judged by their appreciation and application of what public health has to offer for disease control.

We have much to be thankful for and yet there is so much to be done. Tuberculosis which used to kill 200 out of every 100,000 people has now been reduced in enlightened communities to 80, and yet 100,000 people die annually in the United States from tuberculosis—which is far too unsatisfactory a picture. While infant mortality has been reduced materially in the past 25 years, there are still too many youngsters dying before the first year of life from known preventable causes. Diphtheria, which has been reduced considerably because of the established method for determining the individual's susceptibility to the disease followed by his immunization, is still causing too many deaths. There are too many people still unvaccinated and therefore susceptible to smallpox.

We are faced with the problem of determining the method of bringing these facts to the door of the community. The medical profession which has so unselfishly given of itself must always be the basic medium for the promotion of adequate health education. No one need think of any scheme which will have in mind the replacement of the family physician but should rather develop a stimulus for the establishment in the minds of every qualified practitioner not only a solid foundation of knowledge in the field of curative medicine but a keen interest in preventive medicine. The control of rapidly increasing degenerative diseases demands a complete readjustment of functions of the family physician which will include the systematic frequent examination of apparently healthy people.

To the neighborhood church, school and settlement house there has been added in recent years a community house of health defined by many people and in many places as a "health center". These institutions are functioning and flourishing in many sections of the United States and frequently build around one public health service or another. In one place the emphasis is on tuberculosis, another health center is featuring child health, a third one is emphasizing social hygiene.

Boston, in keeping with its tradition and well-established reputation for leadership in medicine, in the arts, and in general culture, thought only in terms of a health center which might sufficiently correlate the health and welfare activities early functioning in various parts of the city. I remember very well attending a meeting held at the home of Dr. Richard Cabot together with Dr. Mahoney and Dr. Shea of the Health Department and to which representatives—official and voluntary—of health and welfare agencies, gathered to discuss the possibilities which lie in the field of correlation and coördination of existing activities in Boston. As a result of this meeting the experiment of a health center was first conceived and opened at Blossom Street in the West End section of Boston. The original Blossom Street Health Unit is still functioning today and is about to be replaced by a very modern structure—a gift and

*September 24, 1929.

†For record and address of author see "This Week's Issue," page 698.

product of the George Robert White Fund. Because of the results of the Blossom Street Health Unit in the development of better co-ördination and correlation, because of the development of a better understanding between both official and voluntary groups, and because of a sound community reaction to the public health principles stressed at the Blossom Street Health Unit, the trustees of the George Robert White Fund came to the conclusion that in the erection of a chain of health units, to function in such sections of the city of Boston as appeared to need them the most, there might be carried out in the most fitting manner George Robert White's wishes that the income of this fund be used "for the erection of works of public utility and which may best serve the citizens of the city".

The leadership of the various health units is vested in the Health Department of the City and the units house all the worthwhile activities of the various leading health and welfare agencies. To the unit comes the expectant mother for prenatal service. Here the mother comes with her new-born baby for health instruction on how to keep it well. Here the decentralized clinics of the Forsyth Dental Infirmary carry on the splendid work of this institution. Posture clinics, tuberculosis clinics, mental hygiene clinics, nutrition clinics, periodic health examinations for adults and examinations for day nurseries and camps, etc., are some of the other Health Department activities. To the unit come people for requests for the free physician for the poor as well as for the district nurse for all sorts of health service and health advice. The sanitary inspector and the food inspector make their local headquarters here also.

Mindful of the invisible line of demarcation between poverty and disease the Unit houses which are the outstanding social agencies designed to solve the problem of health are closely inter-related with the problem of poverty and the daily intimate contact of workers in both groups thereby insuring an expeditious solution of serious problems.

That efficiency, so characteristic of American business, appears to have been exemplified in the development of this plan. It manifests itself by the streams of visitors from all over the civilized world who come to study what appears to be an apparently sound scheme of community health and welfare organization. Surely no more inspiring effort can be made than to carry on a great movement which has in mind the promotion of better health and welfare.

How happy you must be, Mrs. Bradbury*, to see the fulfillment of your brother's wishes in the development of these "department stores of health" and I can see Mr. White looking at this work through your eyes. It is fitting indeed that this temple of health should be erected in the shadows of the House of God so that we may work together in the production of clean bodies and clean minds.

*Mrs. Bradbury is the sister of George Robert White.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 15401

EPIGASTRIC PAIN RELIEVED BY FOOD

MEDICAL DEPARTMENT

An American skilled mechanic fifty years old entered January 28 complaining of abdominal pain.

Three months before admission he began to have gnawing pain in the midepigastrium coming on at about ten o'clock in the morning and somewhat relieved by eating crackers. Since the onset of the illness his appetite had gradually failed and his bowels had become increasingly constipated. He had only one or two movements a week in spite of milk of magnesia. His stools were very hard and bullet-like and at times almost but not quite black. He had considerable gas by mouth and by rectum and some distention, at times relieved by passing gas. For the past two months he had been awakened quite regularly at about one o'clock in the morning by diffuse, steady, colicky abdominal pain. He was seen by a physician who examined his urine and thought there were traces of urinary stone. A month before admission he again saw the physician because of increasingly severe pain which kept him awake from one o'clock for the rest of the night. The pain was steady and more or less generalized throughout the abdomen. He was told that he probably had indigestion and was given a liquid diet, largely broth and milk, with limited water. The pain continued to grow more severe. For the past three weeks he had been taking milk every two hours with some relief. When the pain awakened him he found that drinking warm milk, keeping as quiet as possible, sometimes taking soda and often applying a hot water bottle as well as firm pressure gave him some relief during the attack. The pain, however, was still severe, often doubling him up and making him groan. After four or five hours the attacks gradually passed off. Sometimes there was a steady ache at the tip of the spine, relieved by passing gas. Ten days before admission he was advised to stop work because the attacks were coming during the day. They tended to be worse in the afternoon, less severe in the evening and very severe in the early morning hours. They were not related to food or defecation. His bowels continued to grow more constipated and the gas more pronounced. Four nights before admission he vomited twice during an attack with relief. The vomitus did not look like coffee grounds. Three days before admission he had an enema with good results. His bowels had not moved since that time. He had lost twenty pounds since the onset of the illness, although his strength had remained fairly good. He urinated five or six times by day, two or three times at night. Occasionally he had a little pain and difficulty in starting the urinary stream.

He had scarlatina at ten years, appendectomy at sixteen. Three years before admission he had bladder trouble which cleared up upon his passing a stone. A year before admission he had an attack of sciatica in the right leg.

His mother died of shock.

Clinical examination showed a fairly well developed man who seemed to have lost weight, lying comfortably flat in bed, rather listless, worried and stamped as chronically ill, but in no acute pain. Skin sallow, dry and inelastic, on the arms rough and somewhat scaly. Tongue showed a thick white pasty coating and also slight tremor. Moderate pyorrhea. The heart showed no enlargement or other abnormality. Pulses and arteries normal. Blood pressure 140/85. Lungs normal. In the right upper quadrant close to the right border of the rectus muscle there was a suggestion of an irregular, moderately firm and fairly freely movable mass, not tender, moved little by inspiration. Liver edge felt 1.5 centimeters below the costal margin upon deep inspiration. Lower lobe of the right kidney palpable. Prostate slightly firmer than normal, symmetrical, smooth and not tender. Extremities, pupils and reflexes normal.

Urine: amount normal when recorded, specific gravity 1.024, one or two leukocytes per high power field at one of two examinations. Blood: 9,950 leukocytes, 78 per cent polymorphonuclears, hemoglobin 70 per cent, reds 5,350,000, slight anisocytosis and poikilocytosis, platelets normal. Fasting contents of the stomach 60 cubic centimeters, free hydrochloric acid 25, total acidity 50. Test meal 50 cubic centimeters, no free hydrochloric acid, total acid 38. Guaiac negative on both. Lactic acid negative on test meal. Stools deep purple in ether layer at one examination, benzidine strongly positive at another. Gastric lavage: benzidine very strongly positive.

X-ray examination showed a large six hour residue in the stomach. The stomach appeared dilated. Peristalsis was sluggish and reversed and did not traverse the lower third of the stomach. In this region there was an extensive constricting filling defect through which only a very narrow stream of barium could be seen to pass. The duodenum filled poorly but appeared normal.

Temperature 98.4° to 100° until February 1, then 96.8° to 103.9°. Pulse normal except for

a terminal rise, 107 to 160. Respirations normal.

February 1 operation was done. The following day the patient was extremely ill, with tenderness in the flanks. The chest was clear. February 3 he died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

All of those more recent symptoms of course are neutral in the sense that they do not point to any one disease. The only distinctive symptom is relief by food. The other stomach symptoms are common in diseases situated both in and out of the stomach.

Pain that wakes a man regularly at one o'clock is very distinctive. There are very few things except peptic ulcer that will awaken a man every night for a month. It might be gall stones, it might be various things if he wakened say once or twice a week, but not at the same hour every morning. I do not know of anything else which gives this story except (1) hyperacidity and gastric spasm or (2) ulcer.

A Physician: How about gastric crises?

Dr. Cabot: They never come so regularly. That pain might occur once or twice a week, but not every night and at the same time. The regularity of the hour is very characteristic of the diseases that I am thinking of.

What do you suppose his physician saw in the urine?

A Physician: He may have seen some blood cells.

Dr. Cabot: Would you report that as traces of stone? It was perhaps sizable masses of crystals, which we call gravel. That is possible, but I do not think it is very probable. You see this physician was looking for a cause for pain, looking with a "prepared mind"* of a very particular kind. I think a prejudiced mind in this case.

Attacks lasting from one o'clock until morning are rather surprisingly long for peptic ulcer.

Steady pain, generalized throughout the abdomen, could be ulcer. Ulcer pain starts in one spot and then spreads, so that it can be everywhere or anywhere.

Indigestion is a safe diagnosis so far, but a little over-conservative. The patient might have suspected that himself.

We should expect the pain to grow more severe on a diet of broth and milk with limited water. We should expect relief from milk diet.

There is nothing especially characteristic about the ache at the tip of the spine. It might be due just to distention of the rectum.

The time of the increasingly frequent attacks is characteristic of the same thing that has been growing plainer and plainer in your consciousness and mine.

A Physician: Isn't it unusual in ulcer to have pain that causes one to double up?

Dr. Cabot: No. One of the first things that brought that to my attention happened one time when I went to see Dr. Osler at Oxford. He took me to the infirmary to see an English rustic. This man had this trouble. He had just come in that morning and was describing his experiences of the previous night. The substance of his remarks was that his pain was so severe that his only way to get relief was to get his wife to kneel on his stomach, and his wife, he said, was "kneeling on his stomach half the night." That shows severe pain, if a man resorts to anything as heroic as that. The pain may be of any degree, from very mild so that you can go about your business with it, to the most severe.

A Physician: Does the very acute attack suggest rupture?

Dr. Cabot: No. Rupture does not necessarily give any attack of pain that you can recognize. I do not mean of course complete perforation, but incomplete perforation. I have seen many cases in which X-ray showed perforation, though there had never been any sharp attack at all.

The vomiting is interesting because it has come late in the course of his disease. Vomiting usually is late in the course of peptic ulcer, which I assume this is. The patient goes on for a long time before he comes to the point of vomiting.

I do not believe that we need to be turned aside by those urinary symptoms from the idea in your mind and in mine, that is the diagnosis of peptic ulcer. Persons who are kept awake at night by pain are almost certain to want to pass urine once or twice at night. At his age, too, a prostatic trouble is not at all unusual.

I cannot connect any of his past history with the present illness.

NOTES ON THE PHYSICAL EXAMINATION

He has a very dry skin, if that scaliness was not merely a local affair. But if he was generally dehydrated it would suggest that he had a pyloric obstruction. Ulcer, if it is ulcer, cancer, if it is cancer, would cause obstruction in his pylorus. Water is not absorbed in the stomach but in the intestine. When there is blocking of the pylorus water goes into the intestine very imperfectly. The patient dries up. Some of the most desiccated patients I have seen were those with obstruction of the pylorus.

The tongue is usually clean in peptic ulcer. Most types of indigestion cause a coated tongue. This tongue is not clean. That is against the diagnosis I have been suggesting.

Of course if that abdominal mass is not merely "suggestive" but real we are much more likely to find cancer than ulcer. Ulcer can give

* "Chance favors the prepared mind." (Pasteur.)

a mass. The perigastritis about a partly perforated ulcer may give a very sizable mass which a surgeon with the thing in his hand sometimes cannot distinguish from cancer. Some cases that have recovered after an operation for "cancer of the stomach" have, I believe, been really this perigastritis from ulcer. Still, most cases that show tumor in the epigastrium turn out to be cancer.

"Lobe of right kidney palpable" signifies normal. If a kidney is palpable in a woman keep it dark. If you say anything about it you will develop a first rate neurosis at once. Keep it dark and it will never do any harm.

A PHYSICIAN: What if you do not tell her the diagnosis and she goes to another physician who does?

DR. CABOT: That is rather a good point. I think if you are pretty sure some other fellow is coming along, if the patient is a rolling stone, you had better explain. If she is the type that will stay with you, you had better not explain.

A PHYSICIAN: I tell the head of the family the story of what I have found, making him promise never to tell the patient.

DR. CABOT: That is a good way, if you are sure that what he says he will carry out. Down in the pelvis is a very safe, comfortable, pleasant place for a kidney to be, of no harm whatever to the patient or the patient's family. It is wiser and better not to tell anybody.

That is a rather unusual combination of findings in the gastric analysis. Ordinarily if you get no free hydrochloric acid with the test meal you will not get it without the test meal.

A PHYSICIAN: What was the test meal? Was it the Ewald meal?

DR. CABOT: Yes, probably. It is a very useful test meal.

There is evidence of hemorrhage somewhere in the gastro-intestinal tract. It may mean something. But they may not have excluded meat from the diet. Again, it is after lavage; the stomach tube may perfectly well have caused it.

Dr. Holmes will tell us about the fluoroscopic examination.

DR. GEORGE W. HOLMES: It is customary in this clinic to make examinations of the stomach by fluoroscopy. Stomach plates are taken whenever we find some things we want record of, rarely as an aid to diagnosis. This accounts for our not having plates in all cases.

The examination here shows a large six-hour residue. We believe that if a six hour residue is present it is a very important finding. To make it important you have to be sure the patient fasts during that six hour period and that the type of meal is the standard meal. He must not be given such drugs as morphia or subjected to any disturbing examinations. Otherwise you may get a six hour residue. If a patient has a large residue at the end of six hours he ordinarily has some organic disease.

The accuracy of the statement that the stomach was dilated depends upon the ability of the man who made that observation. The findings might be interpreted in more than one way. The normal stomach is the size of what you put into it. You cannot be sure that it is dilated because it is large.

DR. CABOT: Suppose you put nothing into it?

DR. HOLMES: There would be no shadow except the gas bubble at the fundus.

It is the tendency of the stomach to contract upon whatever is put into it. A study of peristalsis is important in making a diagnosis in gastric ulcer. You would expect to find hyperperistalsis and stasis when the opening from the stomach is obstructed. Where there is an obstructive lesion at the pyloric ring there is increase of peristalsis in order to overcome the obstruction. As the obstruction increases there comes a time when the stomach is unable to take care of the obstruction and becomes dilated much as the heart does in valvular lesions. In this case sluggish peristalsis may mean that we are dealing with a marked degree of block and dilatation or with a lesion in which sluggish peristalsis occurs from other causes.

Reversed peristalsis occurs in cancer, obstruction and more often in tabes. Failure of the peristaltic wave to pass over any portion of the stomach is of great importance. It is frequently present in cancer. Such a constriction as that seen here usually means an annular mass causing a filling defect of the stomach or spasm. It is not always easy to distinguish between spasm and annular constriction. Spasm is a common accompaniment of cancer in its early stages and occasionally of ulcer. We do not feel that we can put much reliance on atropine or amyl nitrite. Occasionally they relax spasm. Usually they do not. Having the patient wait fifteen minutes or repeating the examination on another day is a more satisfactory procedure. If we had been in any doubt as to whether this was spasm or constriction we should probably have had the patient return. Retention may occur either in spasm or constriction, but it is more likely to occur in constriction.

Failure of the duodenum to fill simply means that food is not getting through fast enough.

With these findings, how far are we justified in judging as to what is present? I think that in making X-ray reports we should never go beyond that of which we have good evidence. In other words, a good description of what is present, with some suggestions as to what sort of lesion might cause it, is much better than an out and out statement. We can say that this man has obstruction at the pylorus, a definite lesion in the region of the pylorus and the lesser curvature. That brings us down to two things, ulcer or cancer. The differential diagnosis between ulcer and cancer is not possible in a considerable percentage of cases. Some cases are characteristic. Marked obstruction is more common in

ulcer than in cancer. Hyperperistalsis is much more common in ulcer than in cancer. The dilatation is characteristic of ulcer, but he has not the type of peristalsis to go with it. I would rather not say whether he had ulcer or cancer, or to go any further than to say that he had an obstructive lesion at the pylorus.

DIFFERENTIAL DIAGNOSIS

DR. CABOT: I agree absolutely with what Dr. Holmes has said. It is going to be either ulcer or cancer. If there is anything else that will give this picture I do not know of it. I will confine myself to the points distinguishing those two lesions.

(1) In the first place, time. The time from start to finish is three months. That is strongly in favor of cancer and against ulcer. A patient who in three months gets into such a terrible condition as this man was in, aside from any defects the operation itself brought about, seldom has ulcer. Ulcer has a long history in the vast majority of cases. Most cases of cancer have a short history.

(2) Most ulcer cases have marked periods of remission, and most cancer cases do not.

(3) The character of the symptoms is much more like ulcer. There seems to be relief from food and soda, he has pain awakening him in the night, he has very little vomiting; all those favor ulcer.

(4) Tumor is much commoner in cancer, if what they thought they felt was a tumor.

(5) The stomach chemistry is on the whole more like cancer. The number of ulcer cases in which we get no hydrochloric acid after a test meal is small. No acid after a test meal usually means cancer, I mean if we have to consider only those two.

(6) I should have said the X-ray favors cancer if you had not heard an expert radiologist who knows a thousand times as much about it as I do, say that he cannot say. Sluggishness of peristalsis, apparent dilatation, the nature of the lesion described, would have made me say it is more like ulcer than cancer. But there is no question that I am wrong about that.

On the whole the case sums up as a good deal more like cancer than ulcer. It might be cancer developing on ulcer at the end, something which according to the Mayo Clinic is a very great possibility and according to Dr. Warthin of the University of Michigan a very small possibility and according to us somewhere in between, the possibility of cancer growing in or out of ulcer. Dr. MacCarthy of the Mayo Clinic says 10 per cent do that, Dr. Warthin says one-half of one per cent do it. Our pathologists here say a very small percentage and let it go at that. I do not believe cancer often develops out of ulcer. But this is a possible history to substantiate that belief. It may be that Dr. Mallory will tell us that there is cancer growing out of ulcer.

A PHYSICIAN: Is the blood picture perfectly consistent with either?

DR. CABOT: It is more like cancer. There is a little anemia. Most cases of ulcer do not show anemia.

A PHYSICIAN: Isn't the age in favor of cancer?

DR. CABOT: Yes. I consider his age and the duration of the illness certainly in favor of cancer.

A PHYSICIAN: Is not cancerous metastasis suggested by the enlarged liver?

DR. CABOT: We are not at all sure that the liver is enlarged. If it is enlarged it is in favor of cancer and of course metastasis.

A PHYSICIAN: Couldn't you look upon this as a perforating ulcer with a mass?

DR. CABOT: I do not feel certain that he did not have that.

A PHYSICIAN: Isn't the history of pain coming on two hours after eating more suggestive of something beyond the pylorus?

DR. CABOT: The old idea was that pain coming on soon after a meal was gastric, pain coming two hours after a meal was duodenal. We do not say that now. We find too many exceptions both ways.

A PHYSICIAN: I do not see any Wassermann report.

MISS PAINTER: It was not recorded.

DR. CABOT: It is not a very serious omission. I am voting for cancer and leaving the rest open. I do not know whether it is cancer on top of ulcer or not. The blood shows a little anemia, and most cases of ulcer, unless they vomit blood, do not show any anemia. It is quite common in cancer.

A PHYSICIAN: You mean the blood smear, not the red count?

DR. CABOT: The smear shows deformity in the size and shape of the red cells.

PRE-OPERATIVE DIAGNOSIS

Carcinoma of the stomach.

OPERATION

Spinal novocain. Transverse incision. A large ulcerating carcinoma of the lesser curvature of the stomach was found. The glands in the gastrocolic and hepatic omentum were enlarged. The carcinoma extended upward nearly to the region of the cardiac opening of the stomach. There were no metastases in the liver. The growth was slightly adherent to the pancreas. The gastrocolic and hepatic omentum was tied off and the growth and the pyloric region of the stomach were dissected out. The duodenum was cut across and inverted with two rows of continuous catgut sutures. The stomach was then elevated and the coronary arteries tied off close to the esophageal opening. The stomach was then clamped above the growth and

cut off. This section was so high as to make the stomach difficult of access for suture. The end of the stomach was partly closed with two rows of continuous catgut sutures. The apex of the stomach was brought through the mesocolon and anastomosed to the jejunum. The distal part was annexed to the greater curvature. The wound was closed without drainage.

PATHOLOGIC REPORT

The specimen is a segment 13 centimeters long from the pyloric portion of the stomach. An extensive hard nodular mass is palpable along the lesser curvature and there are a number of small glistening nodules on the serosal surface here. The mucosal surface shows a large oval neoplastic lesion 8 by 5 centimeters in size with its center over the lesser curvature near the pylorus. The lesion almost encircles the prepyloric region and the margin here is prominent and lies in front of the pyloric orifice. There are a number of enlarged glands and one firm mass 2.5 by 2 by 1 centimeters in size in the omentum.

Microscopic examination shows a carcinoma differentiated in places as an adenocarcinoma but growing chiefly in infiltrating strands with a moderate amount of stroma. There is considerable variation in the cells and mitotic figures are numerous. The glands show well marked metastatic involvement. The findings indicate a rapidly growing tumor.

Adenocarcinoma.

FURTHER DISCUSSION

That does not mean the glands were cancerous. Many times I have seen enlarged glands that were merely inflammatory. We cannot say there is no hope because of large glands.

They did a radical operation. I judge they tried to take out the whole thing. It was a noble attempt, but in this particular case did not succeed.

INTERPRETATION OF X-RAY

The findings are probably due to obstructing carcinoma of the lower third of the stomach.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the stomach.
Peritonitis.

DR. RICHARD C. CABOT'S DIAGNOSIS

Carcinoma of the stomach.

ANATOMIC DIAGNOSIS

1. *Primary disease.*
   Adenocarcinoma of the lesser curvature of the stomach and the prepyloric region.
2. *Secondary or terminal lesions.*
   Operative wound, resection of pyloric portion of the stomach.
   General peritonitis.

DR. TRACY B. MALLORY: The autopsy findings are merely those of general peritonitis as a result of an area of necrosis along the suture line, with escape of infected material into the peritoneum, the inevitable outcome of a considerable percentage of gastric operations due to no failure of operative skill.

DR. CABOT: Is there anything to show that this did or did not begin as ulcer?

DR. MALLORY: There is no indication at all that it did, although I do not believe that that necessarily rules it out. On the whole, the history is evidence against it. If it had arisen on a basis of ulcer there should be a history of ulcer running back for years.

DR. CABOT: They undertook a tremendous radical operation, an operation fraught with very great danger, first because of the thing that happened, leakage, and secondly because of the difficulty of nourishing the patient with only a third of his stomach left. They were entirely justified in doing this very dangerous operation in view of the fact that the patient had not very much to lose. They were right in taking a tremendous risk, since there would be nothing but misery if they let it alone.

A PHYSICIAN: Where was the area of necrosis?

DR. MALLORY: Along the anterior wall.

A PHYSICIAN: The incision there cut off the blood supply to the stomach wall.

DR. MALLORY: Probably.

CASE 15402

CAN WE MAKE A DIFFERENTIAL DIAGNOSIS?

SURGICAL DEPARTMENT

A man of forty-three entered the Chelsea Memorial Hospital June 27 complaining of severe colicky epigastric pain which developed suddenly the morning before admission. Soon after the onset he vomited several times. He had never had a similar attack. He knew of no indiscretion in diet preceding this one. The pain quieted down after an hour or two, leaving however a residual ache in the epigastrium. In the evening he was seized with generalized colicky abdominal pain, followed again by vomiting. During the night pain recurred frequently, sometimes across the lower abdomen. At times it was excruciating. It did not radiate, and apparently had no relation to the genitourinary tract. There was no history of trauma, or of indigestion or other gastric disturbance in the past. He did not feel feverish. He had had no diarrhea, and had a good bowel movement the day of onset; none the day of admission. He had not eaten since noon the day of the onset.

For ten days his left index finger had been sore.

His past history, family history and habits were all negative. He denied venereal disease.

On clinical examination he appeared to be in acute pain. Examination showed marked tenderness and rigidity of the entire abdomen, most marked in the epigastrium. There was no distention. The blood pressure was 130/90. The examination was otherwise entirely negative except that the sheath of the flexor tendon of the left index finger was septic.

Pre-operative examination of the blood showed 14,200 leukocytes, 88 per cent polymorphonuclears, hemoglobin 96 per cent, reds 4,920,000. The urine showed a trace of albumin and an occasional pus cell.

X-ray examination of the chest and the genito-urinary tract showed no pathology.

The temperature before operation was 98.2°.

Discussion

BY WILLIAM MARTINDALE SHEDDEN, M.D.

This case is introduced into the Massachusetts General Hospital series because the problem is the same as that in Case 13562, published January 26, 1928, and comparison of the cases is of interest.

In both cases the pain preceded the vomiting. A not uncommon cause of vomiting closely following pain is the stretching of a hollow organ. Dilatation of the renal pelvis in pyelography may cause vomiting, as may also a stone in the ureter or the bile ducts with back pressure and dilatation. Both patients were alike again in having no history of previous attacks of pain or vomiting. It is rather striking also that they both had relative freedom from discomfort between attacks. The present patient went from morning until evening with only a residual ache in the epigastrium. The girl in Case 13562 went five days between two of the attacks feeling quite well. Again, in both instances the pain was at times excruciating, and in both it was in the midline, though in the earlier case it was at the level of the umbilicus. Attempts at eating caused nausea and vomiting with the first patient. The present patient said that he had not eaten since the onset of the pain because he had a feeling that food would cause an exacerbation of symptoms. The leukocyte count of 14,200 complicates the present picture, for we do not know whether to ascribe it to the abdominal pathology or to the septic finger. The girl had a leukocytosis of 16,800. In both cases the temperature just before operation was 98.2°.

The abdominal examination in the two cases was somewhat different. With the girl there was tenderness in both lower quadrants. With the man the entire abdomen was tender, but most markedly so in the epigastrium. The girl's abdomen was somewhat distended. There was no distention in the present case.

In the differential diagnosis of this case the first thing one considers is obstruction, suggested by the colicky epigastric pain, indicating hyperperistalsis, and by the vomiting. The bowels have moved within twenty-four hours, however, and there is no distention. In the case of the girl, the bowels moved daily. Acute pancreatitis will usually give a picture of more or less collapse. Neither case presented this picture. We cannot rule out a perforated appendix with peritonitis, but the character of the pain is against it. The normal blood pressure is also against a completely perforated viscus. We have no history suggesting pathology of the stomach or duodenum; but the diagnosis most nearly fitting this case seems to be subacute perforation of a duodenal ulcer.

PRE-OPERATIVE DIAGNOSIS

Subacute perforation of duodenal ulcer.

OPERATION

Ether. The abdomen was opened through a high right rectus incision which was extended secondarily below the umbilicus. The stomach, duodenum, gall bladder and pancreas were normal. The small intestines were found to be somewhat distended and filled with a dark brown fluid, while the cecum and colon were collapsed. There was about four or five ounces of reddish-brown free fluid in the abdominal cavity. On exploration a volvulus was found, involving the lower end of the ileum for about three feet. The mesentery and loops of bowel were untwisted counter-clockwise and an ileostomy done, inserting a number 20 French catheter. The appendix was normal. A cigarette wick was inserted beside the catheter and the abdomen sutured in layers.

Immediately after the operation 500 cubic centimeters of intravenous saline was given.

The tendon sheath which the patient's doctor had previously opened was given better drainage.

Further Discussion

Rokitansky, quoted by several authors, states that the entire mesentery may rotate several times on its axis*. This happened in the case of the girl. With our patient only a section of the mesentery rotated. This is an important difference as regards prognosis, for the more completely the mesentery is involved in the rotation the more chance there is that the inferior mesenteric vein will be traumatized and become thrombosed.

The diagnosis of volvulus is rarely made before operation, and sometimes is not made even at operation, the explanation of the patient's symptoms being brought to light first at the autopsy table. The mortality varies from 50 to 65 per cent.

*Quoted in Keen's Surgery, 1908, IV:667.

The onset is usually sudden. Pain and vomiting are prominent. The pulse, temperature and respirations may not be affected for a considerable period. There is usually a tense distended abdomen, and there is frequently a history of lack of bowel movements. Sometimes at operation adhesive bands may be found as the source of the volvulus. The finding of bloody fluid in the peritoneal cavity is common in cases of intestinal obstruction, especially those with much strangulation of circulation.

It is rather interesting to note some of the points that have been made in an attempt to develop a differential diagnosis of this condition. Many of these findings were absent in one or both of the cases we have been considering.

(1) Obstipation. Absent in both cases.
(2) Severe abdominal pain. Present in both cases.
(3) Pain localized in the left lower quadrant and persisting there. Absent in both cases.
(4) Profound shock. Absent in both cases.

An ileostomy usually gives the patient a good chance for cure, as the toxic material in the obstructed gut is thus drained off. If the gut is not viable and a one-stage resection seems unwise, a Mikulicz operation is to be thought of, bringing the gangrenous gut outside the abdomen.

Two other cases of volvulus which are of interest for comparison have been published in this series in recent years, Case 12303, July 29, 1926, and Case 13222, June 2, 1927.

Further History

The convalescence was complicated by an atypical pneumonia and the septic finger. At the patient's discharge August 16 the wound and the finger were entirely healed and the heart and lungs normal. Three weeks later his doctor reported that the patient was having daily bowel movements and had no symptoms.

Diagnoses

Volvulus of the ileum.
Bronchopneumonia.
Septic left index finger.

THE INVESTIGATION OF AIR POLLUTION AT THE MELLON INSTITUTE

During 1911-1914 Mellon Institute sponsored the first broad scientific study of smoke abatement. This preliminary investigation had as its objects the determination of the extent of air pollution by smoke in the city of Pittsburgh and the initiation of preventive measures to curb the smoke nuisance. After sufficient data had been obtained on sootfall, legislation was directed toward the minimization of dense smoke; obnoxious gases and solids not imparting color to the smoke stream were not considered then. This legislation served as a basis for smoke abatement laws in other cities in the United States and even in Europe, particularly in England.

Subsequently, in 1923-24, a supplemental survey was made by the institute to determine the effect of the Pittsburgh ordinance on the state of atmospheric pollution. The data showed an approximate decrease of 70 per cent. in smoke, but an increase of 40 per cent. in total solids, as compared with the results of the first investigation.

The results of the two studies have been incorporated in ten bulletins and a number of papers published by the institute. The following improvements in conditions brought about by the smoke abatement regulations may be pointed out: material reduction in dense smoke; improvement in combustion methods; improvement in boiler and furnace design, and increase in possible sunshine with a corresponding decrease in the number of "dark days."

This work has recently been re-ëstablished as one phase of the institute's basic, non-commercial research. The investigation is in charge of W. A. Hamor, assistant director of the Mellon Institute, and H. B. Meller, senior industrial fellow. The latter was head of the survey in 1923-24. At the present time they are being aided in the experimental work by four assistants, but the comprehensive plans for future work will necessitate a larger personnel.

In a broad way, the goal of his work is not only to arouse public interest in the evils of air pollution, but also to develop, to propose and to secure the initiation of effective and economically feasible measures for relief. It will be necessary to consider, in addition to "dark smoke," the solids and obnoxious gases that do not give dark color to the gas stream.

The more specific topics which a study of this scope will entail include: methods of sampling and analyzing air; characteristics of effluent gases from different types of buildings, such as industrial plants, commercial plants, private dwellings, locomotives, steamboats and automobiles; determination of the amounts and characters of the emissions from boilers and furnaces under different conditions of loading, fueling and firing; effects of different kinds and amounts of solids in the absorption of light rays of certain wave-lengths; effect of solids in the atmosphere on the formation and character of fogs; effect of different velocities of air currents in dispersing fogs containing different percentages and sizes of solids; effect of barometric pressure changes on the stability of fogs.

The extension of the investigation into the field of public health is of such general interest that it deserves special mention. The comparatively unknown effects on health of smoke, visible and invisible, present a field for inquiry whose importance can hardly be overestimated. Then, too, the hygienic aspects of natural ultra-violet radiation will be searchingly studied.—Lawrence W. Bass in *Science*.

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

COMMITTEE ON PUBLICATIONS

HOMER GAGE, M.D. JOHN W. BARTOL, M.D.
ROGER I. LEE, M.D. ROBERT B. OSGOOD, M.D.
EDWARD W. TAYLOR, M.D.

EDITORIAL STAFF

DAVID L. EDSALL, M.D. STEPHEN RUSHMORE, M.D.
REID HUNT, M.D. HANS ZINSSER, M.D.
JOHN P. SUTHERLAND, M.D. BENJAMIN WHITE, PH.D.
GEORGE R. MINOT, M.D. HENRY R. VIETS, M.D.
FRANK H. LAHEY, M.D. ROBERT N. NYE, M.D.
SHIELDS WARREN, M.D.

WALTER P. BOWERS, M.D., *Managing Editor*

ASSOCIATE EDITORS

GEORGE G. SMITH, M.D. WILLIAM B. BREED, M.D.
JOSEPH GARLAND, M.D.

THE NEW HAMPSHIRE MEDICAL SOCIETY
PUBLICATION COMMITTEE

D. E. SULLIVAN, M.D. H. H. AMSDEN, M.D.
R. H MARCOTTE, M.D.

THE VERMONT STATE MEDICAL SOCIETY
PUBLICATION COMMITTEE

WILLIAM G. RICKER, M.D. C. F. DALTON, M.D.
J. A. WARK, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 165 Newbury Street.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 165 Newbury Street, Boston, Mass.

THE MEDICAL SCHOOL AND MEDICAL HISTORY

THE dedication of the Department of the History of Medicine and of the William H. Welch Medical Library of the Johns Hopkins University, this fall, marks another point in the growing interest and in the appreciation of the importance of the history of medicine in this country. Only recently the Osler Library at Montreal was opened, shortly to be followed by the splendid catalogue of the library prepared by Dr. Francis and his associates. These two centers of activity will be well under way by winter, neither of them new, perhaps, but both greatly augmented by recent acquisitions in both "men and books".

Dr. Welch outlined something of his plans in his address delivered on Washington's Birthday at Johns Hopkins University. Like so many of Dr. Welch's communications, however, it failed to get into print, at least into general circulation. Thanks to Dr. F. H. Garrison (*Bull. N. Y. Academy of Medicine*, August, 1929), we learn something of its contents, as well as some of Dr. Garrison's own ideas about the teaching of medical history as a branch of the medical curriculum. Dr. Welch spoke at length of the recent developments of the subject in Europe and the United States, mentioning the survey and tabulation by Professor Sigerist of Leipzig (*Kyklos*, 1928, I), the consolidation of the three libraries of the Johns Hopkins Medical School, Hospital, and School of Hygiene into a single building, the inspiring influence of Osler in activating an interest in the historical approach from the start, and of its importance in the academic curriculum both as a discipline for the mind and as an agency of humanistic culture. No details are given of Dr. Welch's plan, but it is presumed that ample opportunity will be given for graduate students in the history of medicine at the new Welch Library.

The intensive study of medical history, as Garrison points out, is largely a matter for mature physicians who may have acquired the leisure and financial means necessary for the acquisition of essential literature for private study and for journeys to Europe. The average medical student can have nothing of this. He must begin with a much simpler plan. "Let him study the subject backwards," says Garrison, "not from Egypt and Babylon, Hippocrates or Galen down to our own time, but the other way around, from the known to the unknown, backing into it, so to speak, from the most obvious and available angle." Osler's approach was best: who was Heberden? who was Hutchinson? who was Blaud? An eponym served as "a nudge to ignorance", and here Osler's "wonderful spontaneity, the captivating geniality and contagious enthusiasm of his mentality amounted to positive genius."

In addition to this simpler way of "backing into the subject", Garrison would teach students to make bibliographies correctly, look up the literature and use standard books of reference, for a knowledge of the history of medical literature leads definitely to the literary history of medicine. As much as he may depend on his secretary later to make up bibliographies, the student at the start should always do it himself. Garrison quotes Sir Walter Scott, "The wise man is his own best servant." Then the formation of journal clubs, the development of history of medicine societies and students' gatherings of all kinds should be fostered. Garrison believes that the students might write papers on such well-worn subjects as Hippocrates, Harvey, Sydenham, and Jenner, but *not* for publication. He has too much of an eye to the great avalanche of medical literature which is descending upon us and rightfully says that the student should remember this at the start.

The real opportunities for teaching the medical undergraduate, therefore, do not fall into a definite department of the medical curriculum. All teachers of medical students ought to be able to implant the germ of medical history in students' minds, during section teaching, ward rounds, laboratory work, or during the course

of a more formal lecture. The great developments in the teaching of medical history, such as those in Montreal and Baltimore, are for the graduate scholars to advance research. The student, however, must familiarize himself with the uses of the library and although he starts in the clinic, activitated by a word from his teacher, he must always end in the medical library, where he will find his way about in a short time and will be able to quickly reach the sources of his information. Fortunate, indeed, are the medical students at "McGill" and "Hopkins" with these new foundations open to them.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

HUNT, HAZEL M. A.B. Director of Chemical Laboratory at the New England Deaconess Hospital. She writes on: "Cholesterol in Blood of Diabetics Treated at New England Deaconess Hospital." Page 659. Address: 15 Deaconess Road, Boston.

HINTON, WILLIAM A. B.S., M.D. Harvard 1912. Pathologist and Director of Research, Boston Dispensary; Chief, Wassermann Laboratory, Massachusetts Department of Health; Instructor in Immunology, Harvard Medical School. Address: 25 Bennett Street, Boston. Associated with him is:

BERK, ARTHUR. M.D. Tufts College Medical School, 1921. Chief, Department of Neurosyphilis, Boston Dispensary; Visiting Psychiatrist, Federated Jewish Charities; Assistant, Therapeutic Research, Boston Psychopathic Hospital; Instructor, Neuropathology, Tufts College Medical School; Assistant in Neurology, Beth Israel Hospital. Address: 270 Commonwealth Avenue, Boston. They write on: "A Glycerol Modification of the Kahn Test." Page 667.

SMITH, HENRY O. M.D. Bellevue Hospital Medical College, 1887. Member of Staff, Memorial Hospital, Nashua; President, New Hampshire Medical Society. He writes on: "The Smallpox Menace." Page 671. Address: Hudson, New Hampshire.

DWINELL, GEORGE F. A.B., M.D. Harvard 1915. F.A.C.S. Assistant Surgeon, Elliot Hospital; Surgeon to the New Hampshire State Industrial School. He writes on: "Sterility." Page 677. Address: 913 Elm Street, Manchester, N. H.

WILINSKY, CHARLES F. M.D. Baltimore University School of Medicine 1904; Director Beth Israel Hospital; formerly in charge of the Health Unit in other sections of Boston. He presents an "Address Delivered at the Dedication of the Roxbury Health Unit." Page 688. Address: Beth Israel Hospital, Brookline Avenue, Boston.

THE DOCTOR'S SADDLE BAG

ON TAKING ONESELF SERIOUSLY

CERTAIN physicians of quality were under discussion at the luncheon table one day, and the hammers clinked merrily on the anvil. Of the subjects of the day's repartee none were popular—at least among their colleagues—all were successful, all took themselves very, very seriously, and all were devoid of a sense of humor. The hypothesis was advanced, in fact, in this particular group, that lack of humor is a sine qua non of success, and it was with difficulty that any examples were found of men who could be unanimously voted as successful who possessed a real, spontaneous sense of humor.

As a case to prove the general contention, a late Vice-President of the United States was cited—a man noted for his wit—who had himself readily admitted that his failure to achieve political success (as attested to by his election to the Vice-Presidency) was due to his unfortunate inability to resist making a joke when the opportunity confronted him. This was the man who, being forced ex officio to sit as a trustee of the Smithsonian Institution, found the deliberations of his fellow trustees exceedingly long and almost incredibly dull. Among them were a brace of Senators, a Supreme Court Justice or two, and others of similar kidney. One day, however, he was aroused from his unhappy lethargy by the mention of money, and as was his wont on such occasions (or so he said) he pricked up his ears. The appropriation of a large sum was being proposed to hunt for fossils in Central America. For the first time he spoke. "Gentlemen", were his words, "I am opposed to the expenditure of funds to hunt for fossils in Central America, when there are still so many to be found in and about Washington."

Eagerly he was questioned. Where and what were the fossils to be found about Washington, and why had they not known of them? "There are", he replied, "a number in the United States Senate, several in the Supreme Court, and less important ones scattered among the various Government offices". So sad and reproachful were the glances cast on him that he was humbled; in four years he never again opened his mouth at the Smithsonian Institution and seldom in the Senate Chamber.

It is, of course, obviously ridiculous to argue that a sense of humor is an insuperable obstacle to success. Many of our most brightly shining lights have been men of ready wit, relishing the bon mot and skillful in the carving of the quip. It is equally true, however, that a sense of humor, like a temper must be held in check; it must not be allowed to get out of hand. The public is not particularly discriminating but it is also not particularly quick-witted, by and large, and it views with suspicion the joke-smith. Furthermore, it has its preconceived no-

tion of what the physician should resemble and it prefers to have him dignified to having him facetious. It takes at his own valuation the pompous ass, but it will not brook the silly ass. It will often eat out of the hand of the former, but it will not take its pills from the latter.

Too keen a sense of values—and that implies a sense of humor—is bad for the doctor himself, aside from the viewpoint of his patients. It does not make for his success, as success is usually rated, to know that another could do as well, or better, what he is doing; that many of his performances are of little real value, and that much of his advice is empirical. Far better for him to be impressed with the conviction that his mission is a very serious one, that his works are very valuable, that few, if any of his colleagues, could perform his duties as well as he is doing them, and that his place in the world could with difficulty be filled by another. Emerson said, "Let a man make a better mousetrap than anyone else, and the world will wear a path to his door". Better might it be said let a man *think* he makes a better mousetrap than anyone else, and sell the idea, and his customers will come from far off Timbuctoo.

The Autocrat of the Breakfast Table was a witty man, and what is more, a kindly humorist, and in his early days he took himself seriously enough to enter practice. It did not work, however. The people of Boston were amused to see the little man hurrying about town behind his two large horses, but they did not seek the solace he might have afforded them when their appetites had proven too much for their common sense. One does not go to the doctor to be amused. The Autocrat, notwithstanding, even if he had continued in practice and had never had a patient but had written the Autocrat, would have made a success of his life, if not of his practice.

Much depends on the definition of the word success. If success means to see as many patients as possible in all the time one can command, and then to see one more; to charge them as much as the traffic will bear and then add a percentage to it; to read papers of little lasting value as often as an invitation to read can be elicited; to discuss other successful men's papers whenever one hears them read, then one must be very serious. One must be impressed with the importance of the position which he holds in life. If, however, one feels that he is entitled to have friends and to hold them, to do what he is best suited to do as well as possible, and honestly; to dally a little on his way through life; to enjoy doing what he likes best to do and to see the humor in those situations which have humor, then I maintain that he may be considered successful regardless of the size of his practice or of his income.

MISCELLANY

THE THIRTEENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS

(Continued from page 652, issue of September 26)

A paper on "Ephedrine Compounds" was submitted by Drs. B. E. Read, C. Pak and B. G. Anderson. According to these men methyl ephedrine in the anaesthetized dog in doses of five milligrams per kilo slows and deepens the respiration. This is in marked contrast to ephedrine which, while it may give a primary slowing, has a stimulating effect producing a quicker, deeper respiration. Methyl ephedrine compared with ephedrine has a much less effect upon the blood pressure. A one milligram per kilo dose may even show no effect. The pulse rate is usually slightly increased. The stimulating respiratory effect of ephedrine on a morphinized animal is not produced by methyl ephedrine.

Investigations on "The Relation of Diet to Dental Disorders" were reported by Dr. Milton F. Hanke. Dr. Hanke made blood examinations for calcium and phosphorus and a dietary analysis on 100 cases afflicted with every type of dental disorder. The ages ranged from 4 to 60 years. The diets were, usually, not markedly deficient in vitamin D. Some 40 per cent. of the diets were markedly deficient in vitamin C. It was possible, by means of a diet containing an abundance of vitamin C, to produce solid gum tissue, to arrest caries, and, with the aid of prophylactic measures, to cure pyorrhea and induce bone regeneration in alveolar tissue. The Ca and P content of the blood varies with the age of the individual. Caries and bone absorption may be progressing rapidly in a person whose blood contains normal amounts of calcium and phosphorus. These processes have been stopped by suitable diets without changing the blood values significantly.

The problem of Nutrition within the Enamel of Fully Formed Teeth was dealt with by Dr. William J. Gies. According to him, various changes that occur in the enamel of human teeth have been ascribed to abnormal nutrition within the enamel. The proof that enamel contains protein has induced some investigators to assume that its presence indicates intrinsic nutritional capacity, regardless of the nature of the protein, and also despite the fact that, although permeable to water and various substances in aqueous solution, enamel completely lacks power of self-repair after injury and has no cellular nuclei. It has been recently found that the contained protein is chiefly if not wholly keratin. That it is not associated with intrinsic nutritional changes in the enamel of fully formed teeth was indicated by further observations that conventional tests for tissue enzymes, applied to pulverized enamel from freshly extracted teeth, have been completely negative.

"The Structure of Erythrocytes and the Cause of Hemolysis" was the subject discussed by Dr. W. W. Lepeschkin. He described the erythrocytes as living cells, with protoplasm mostly liquid in form. The more rigid parts of protoplasm form a marginal hoop in the erythrocytes of birds and amphilica, but are not so strongly separated from the liquid protoplasm in the mammalia. The surface of erythrocytes is covered by a colorless pellicle which is formed by concentration phases of the protoplasm and can be liquefied by absorption of water by osmotic

or mechanical pressure. The protoplasm of the erythrocytes represents a colloid solution with different viscosity in different cell parts. A real stroma is absent; no net or alveolar structure is observed, nor "Plasmamembran". The so-called stroma which remains after the plasmolysis produced by poisons is the pellicle. The pellicle is of no importance for the hemolysis. It is easily permeable to hemoglobin which does not leave the cell even if the pellicle disappears completely. The cause of hemolysis is not the bursting or softening of the pellicle but a chemical change in the protoplasm. All substances which produce chemical changes in the principal chemical compounds composing this protoplasm, that is, hemoglobin or lipoids, bring about hemolysis. It is very probable that hemoglobin and lipoids are combined with each other in the protoplasm but in an unstable chemical compound. Decomposition may result from a slight chemical change, high temperature, strong light or mechanical effects. Hemolysis results from the chemical change of hemoglobin.

"The Influence of the Quality of Foodstuffs on Haemopoiesis" was explained by Dr. A. Zih. According to present knowledge, the quality of the foodstuffs has no influence on the number of red blood corpuscles in the adult. Only the lack of vitamins B and C causes a decrease in the number of red blood corpuscles. Even in the case of a diet deficient in iron, the anemic condition only presents itself in the next generation. Contrary to this view Dr. Zih has shown that rabbits on a diet rich in vitamines quantitatively satisfactory, develop anemia if green vegetables are absent. The decrease of the red blood corpuscles stops and increase follows the addition of grass to the diet. It is suggested that the chlorophyll promotes the production of red blood corpuscles, probably through a stimulation of the bone marrow. Earlier experiments have shown that bilirubin exerts influence on the number of red blood corpuscles, namely, that minute doses increase their number. The bilirubin which exists in the haemoglobin of the red blood corpuscles acts like a hormone of haemopoietic action.

"The Relation of the Normal Adult Mammalian Spleen to Red Blood Cell Formation" was investigated by Drs. E. B. Krumbaar, E. Wilson and R. W. Garlichs. They reported an inhibitory effect on the production of red cells attributed to the spleen, because of the relief of anemia that often follows splenectomy clinically; and secondly, the transient polycythemia that sometimes follows removal of the normal spleen, the so-called postoperative anhydremia. These scientists presented evidence to show that the spleen normally has a favorable effect on blood cell formation. Splenectomy in normal mammals is followed by an anemia that varies in duration and severity approximately with the spleen body weight ratio. The anemia can be modified by an iron rich diet. Parenterally introduced splenic extract has a greater effect in increasing the peripheral red cell count than have similar extracts of other organs.

A very interesting report was made by Dr. David B. Macht to the effect that he discovered a toxin in blood of individuals suffering from leprosy which serves to differentiate leprosy and the blood serum of tuberculosis, which it resembles, and declared that this led to an important discovery in the treatment of leprosy. Dr. Macht reported further observations on the blood of malaria, eclampsia sera, and on the extreme toxicity of certain animal poisons—of the toad, bee, ant, and particularly, snake venom.

One of the most interesting papers was on "The Study of the Physiological and Psychological Reactions of the Human Organism to Coffee Drinking". Dr. Macht co-öperated in this exhaustive study conducted by the Food Research Laboratories, Inc. of New York, whose President, Dr. Philip B. Hawk, presented the report. He said that the general conclusions were that coffee drinking exerted no definite or prolonged deleterious influence upon the heart, kidney or gastrointestinal tract. The nervous system was, however, very definitely and unfavorably affected, the test showed, with the result that the mental and mechanical efficiency of coffee drinkers was materially lowered. These conclusions, according to Dr. Hawk, apply with perhaps somewhat lessened force to the influence of an increase, from one to three cups daily, in the coffee consumption of men who had taken coffee in moderate quantity for years. The test was carried out on one hundred young men between the ages of twenty and twenty-six, forty per cent. of whom had taken coffee in moderate quantities for several years, and the rest of whom had never used it. A few of the young men were utilized as "controls" and the rest as active experimental subjects. Several different brands of coffee were used. The conclusions of the test were that the drinking of from two to six cups of coffee daily for a period of weeks or months by normal young men unaccustomed to its use has no outstanding deleterious action on the heart and circulatory system. There was, however, an increase in pulse rate in the majority of cases and cardiac palpitation and increased blood pressure in a few cases. There was permanent interference with the gastrointestinal functions. There were indications of gas formation, indigestion, diarrhea or constipation in fifty per cent. of cases. The kidney function was not deranged to any considerable degree. There was a mild diuresis in several cases and casts either made their appearance or increased their number in other instances. The blood urea and uric acid were variable. The influence of coffee upon the nervous system was pronounced and unfavorable as shown by wakefulness in ninety per cent. and poor quality of sleep in thirty per cent., i.e., bad dreams, etc.; inability to concentrate in seventy-five per cent.; tremors and nervousness in seventy-five per cent. and headaches and dizziness in twenty-five per cent. A further indication of a deranged nervous system was the less satisfactory response to certain psychological tests at the end of the coffee drinking period. Features which apply to between ninety and one hundred per cent. of cases investigated are a prolongation of the simple reaction time, and loss of accuracy in rapid calculating. Certain operations requiring steadiness and proper co-ördination were also performed somewhat less satisfactorily by the majority of coffee drinking subjects.

Although dead hearts of humans are known to have been revived by adrenalin and dead heart muscle has been maue to beat again by means of electrical stimulation, Professor E. Newton Harvey of Princeton University told how dead hearts removed from turtles and frogs have been set to beating rhythmically by sound waves. The waves in question, which two years ago, when they were first spoken of, were

referred to as "the sound waves that kill" because of their ability to kill small fish and other forms of sea life, have now for the first time, according to Professor Harvey, been put to a constructive use. They cannot be heard because their vibrations are too rapid for the human ear, ranging from 300,000 to 2,500,000 a second. They are produced by passing an electric current through a quartz crystal; cut in a certain plane the crystal compresses with the passage of an electric current running in one direction and expands when the direction of the current is reversed. The speed of the contraction and expansion is parallel with the alternation of the current, and it is this contraction and expansion which produces vibration. The experiments were conducted at the Loomis Laboratory at Tuxedo Park, New York, with apparatus devised by R. W. Wood and A. L. Loomis.

According to Dr. Harvey, a beating heart can be made to beat more rapidly by passing sound waves through it, and a non-beating heart can be made to beat rhythmically. But it would not be possible to resuscitate a person whose heart had stopped by means of supersound waves. They may be used in stirring the contents of the cells of living organisms thereby killing bacteria. He pointed out that the waves do not stimulate nerve cells. Many destructive functions were performed by Dr. Harvey, with sound waves. A drop of water, subjected to the waves, is broken up into a fine mist. Elodea cells, part of the organism which makes up the green scum on stagnant ponds, exhibit a rapid internal whirling in presence of the sound. These cells have thin walls and contain chloroplasts, which have the substance producing the green color. Blood corpuscles are sometimes destroyed, but on other occasions "are thrown into nodes of standing waves". This phenomenon may be understood by visualizing waves which stand virtually motionless, holding their shapes as if frozen. In the case of killing small fish, Dr. Harvey said that death appears to be due to the effect on the blood and to the rupture of the gill membranes.

Drs. J. F. Fulton and T. D. Ingraham read a paper on "Emotional Disturbances Following Experimental Lesions of the Base of the Brain (Pre Chiasmal)". A surgical procedure on cats was evolved in order to sever the track of fibers which pass through the globes pallidus to release the hypotholamus from the control exerted by the frontal lobes. After an extensive bilateral decompression the base of the brain was exposed adequately to make an incision in the brain 3 to 4 mm. anterior to the optic chiasm, 2 to 3 mm. in depth, and extending from the mid-line to the olfactory radiation. Survival after operation varying from one to four months followed. In each instance in which the operation had been performed, there was immediately a striking change in the disposition of the animal. Previously friendly and playful, they entered, after operation, into a state of chronic rage, i.e., a condition in which signs of fury were much more easily elicited than in a normal animal. Gently stroking the back, for instance, would evoke spitting, scratching and biting, accompanied by signs of diffuse discharge of the sympathetic nervous system, e.g., dilation of pupils, sweating, and pronounced pilo motor response. They believed that this unusual state is due to a release of the hypothalamic centers for the control normally exerted by the frontal lobes. These observations appear to throw light upon the emotional disturbance and changes in behavior seen clinically with lesions of the base of the brain.

(To be continued)

CORRESPONDENCE

THE TREATMENT OF BITES BY RABID DOGS

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

September 23, 1929.

Editor, NEW ENGLAND JOURNAL OF MEDICINE:

In the past, on the advice of what we considered competent authority, we have been advising persons exposed to rabies to take the fourteen-day Semple prophylactic treatment. Recently a human death from rabies occurred in which the person was bitten on the eyelid and had this treatment started the day he was bitten.

We have been in touch with Dr. McCoy of the United States Public Health Service, Dr. Rosenau and Dr. Zinsser of the Harvard Medical School, and Dr. Park of the New York City Health Department. The consensus of opinion of all these gentlemen is that in the ordinary bite in any portion of the body except the head and neck, fourteen-day Semple treatment is advisable. As to the proper method of treatment of bites of the head or neck, or more severe bites of other parts of the body, there is slight diversity of opinion.

Recently the State Board of Health of Alabama questioned the forty-eight states in the Union in regard to the type of anti-rabic treatment they were advising, and twenty-nine of the forty states that answered the question advised the use of the Semple fourteen-day treatment.

After due consideration of the above, the Department feels justified in advising the use of the fourteen-day Semple treatment in the ordinary case. In view, however, of the greater danger attendant upon bites involving the head or neck, as well as severe and multiple lacerations, the Department would recommend the more intensive and prolonged twenty-one-day course of treatment, using the vaccine prepared according to either the Semple or the Pasteur method.

In addition to the use of vaccine, all dog bites should be cauterized as soon as practicable with strong nitric acid.

Yours truly,
GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

SUGGESTIONS FOR THE TREATMENT OF THE POTENTIAL CRIMINAL

85 101st Street, Corona, L. I.,
September 24, 1929.

The NEW ENGLAND JOURNAL OF MEDICINE:

Your Editorial on "Suggestions with Respect to the Prevention of Crime" interested me greatly, simply because for the last seven years I have given the problem a great deal of thought. As a result, I feel very definitely that crime can be prevented only

by recognizing the potential criminal, and educating him along such lines as is necessary to make him a thoroughly integrated individual.

It is a known fact that criminals invariably show delinquent tendencies during their childhood or adolescence, and all these delinquencies are easily recognized by the school teacher who comes in contact with her pupils daily. I believe too that she can distinguish between the "delinquent" truant player and the mischievous one, but it is hardly fair to expect the school teacher to study each delinquent sufficiently to enable her to handle the problem individually and intelligently in each particular case. The average school teacher, in the first place, is not trained, and secondly, her time is too taken up with the daily curriculum to enable her to study the home and environment of the offender.

It therefore seems to me that the way to meet the situation is to have especially trained "disciplinarians"—men or women who have been trained as psychiatric social workers—in each public school in the more crowded districts, and one disciplinarian for every two or three schools in less crowded districts. These trained workers will be unhampered by other duties, and thus be able to go into each case more thoroughly, and to handle the delinquent with a sympathetic understanding: the crude measures often resorted to by so-called disciplinarians often does more harm than good.

It would seem to me that this scheme would be well worthwhile trying for certainly if it proves workable, the saving to the State of money expended on prisons and reforms would more than cover the cost of maintaining social workers in each school.

Yours very truly,
MRS. F. EDGAR LEDIGER.

A COMMENT ON DR. PUSEY'S LETTER

September 29, 1929.

To the Editor,
NEW ENGLAND JOURNAL OF MEDICINE:

Dr. Pusey's letter in the issue of September 26, 1929, amuses me very much. For what purpose does the gentleman waste so many words when the only thought conveyed is "Keep the skin clean"?

Very truly yours,
ANDREW F. DOWNING, M.D.

A DEFECT IN MEDICAL SERVICE

29 Newbury Street, Boston, Mass.
September 27, 1929.

NEW ENGLAND JOURNAL OF MEDICINE:

Gentlemen:

Recently a member of my household was taken by an attack of appendicitis which came on very suddenly, violently, and was critically serious. Unfortunately the time taken by this attack to develop was late Saturday afternoon before Labor Day. My wife called up every doctor in town that she knew, and in most cases got no answer to the telephone, and I think called some twenty-five men before finally getting anybody.

It seems to me that this is a defect in medical service in Boston and is very serious and quite easily rectified by a little co-öperation among the medical profession. I don't blame medical men for wanting holidays, and of course I imagine it never occurs that there are not sufficient competent men in Boston to attend to the serious illnesses of the population, but the trouble is, how to get at them.

I should think the Medical Society could organize some sort of a central bureau which doctors going out of town could inform with whom they left their practice, and which could arrange that a certain number of physicians would be on duty at all times. Then anyone failing to find the physicians or surgeons with whom they were acquainted could call this bureau and immediately receive the necessary information to cover their case.

Yours truly,
WM. BROSS LLOYD.

RECENT DEATHS

STONE—DR. JAMES S. STONE, former head of the surgical staff of the Children's Hospital, died September 28 at his home on Edmands road, Framingham Center, after a short sickness.

He was born at Newton in 1868, the son of Lincoln Ripley and Harriet (Hodges) Stone, and was graduated from the Newton High School in 1885. He received his A.B. degree from Harvard in 1889, and M.D. and A.M. degrees from Harvard in 1894.

Dr. Stone was visiting surgeon of the Children's Hospital, consulting surgeon of the Boston Floating Hospital, during the last few years it was in service; Boston Dispensary, Infants' Hospital and Framingham Hospital, and an instructor in surgery at the Harvard Medical School.

He was a member of the Massachusetts Medical Society—serving as president in 1925—the American Medical Association, New England Surgical Society and Boston Surgical Society. During the World War he was chief of the surgery service at the Base Hospital, Camp Jackson, S. C. He was a director of the Framingham Town Library.

Dr. Stone also served the Society in the capacity of Executive Secretary.

He was the author of numerous articles, chiefly on surgical diseases of children, many of which have appeared in this JOURNAL. His office was at 264 Beacon Street, Boston.

BARKER—DR. ANNA C. BARKER, 68, medical practitioner for nearly 40 years and on the staff of the Massachusetts State Infirmary at Tewksbury for 20 years, retiring a year ago, died in Portland, Maine, September 24, after an illness of several months.

Dr. Barker practised at St. Johnsbury, Vt., at a time when there were comparatively few women physicians in the United States. After taking a course for nurses in a Portland hospital and also in the Boston City Hospital, she studied medicine, taking her degree at the Philadelphia Medical School. She was a member of several medical associations. Surviving are a brother, Fred T. Barker of New York, and four sisters, Mrs. Arthur L. Berry, Mrs. Linus Seely of Portland, Maine, Mrs. Marye Bagley of Hinckley and Mrs. George Gilpatric of Whiting.—*Boston Herald.*

RUSSELL—At the Home for Aged Women, September 23, DR. FLORA S. RUSSELL, 90 years, widow of Barnabas H. Russell. Funeral services were held at the home, 201 South Huntington Avenue, Wednesday, September 25, at 11 o'clock.

NEWS ITEM

HARVARD MEDICAL SCHOOL—The school year 1929-'30 opened on Monday, September 23, 1929. Of the 516 men registered 137 were fourth year students, 131 third year, 123 second year, and 125 first year men, according to figures issued by the Dean's office. A change has been made in the schedule of the third year men. Whereas formerly the men listened to around fifteen lectures a week, this number has now been cut to six, with the rest of the time being spent in the hospitals in direct contact with the clinical material. It is hoped and expected that this system will prove of more value to the student.

At the School of Public Health 18 students were registered, of whom seven were foreign students. Dr. Douglas D. Murphy and Dr. Grace L. Austin of London are working in Dr. Drinker's laboratory as Research Fellows in Physiology.

In the Warren Anatomical Museum several stained whole sections of brains showing various pathological specimens, rare and unique, are on display. These same sections were shown before the Physiological Congress in August, 1929. If anyone was unable to see them at that time, this opportunity should not be neglected.

NOTICES

BRISTOL NORTH DISTRICT MEDICAL SOCIETY

At the meeting of the Bristol North District Society on September 19, '29, it was voted that the Secretary should communicate with the President of the Society that the territory in this district has been covered efficiently by the Red Cross organization. A skeletal organization of physicians, nurses, hospitals, transportation and canteen supply has been effected for immediate relief. The society is willing to co-öperate at any time but feels that the Red Cross Society has covered the desired field.

J. L. MURPHY, *Secretary.*

REMOVALS

The following doctors have moved their offices to the Longwood Medical Building, 319 Longwood Avenue, Boston:

Dr. Randall Clifford from 475 Commonwealth Avenue

Dr. Paul W. Emerson from 86 Bay State Road

Dr. William J. Mixter from 270 Commonwealth Avenue

Dr. Charles G. Mixter from 270 Commonwealth Avenue

Dr. Reginald H. Smithwick from Massachusetts General Hospital

Dr. Lyman Richards from 270 Commonwealth Avenue

Dr. Francis H. MacCarthy has moved his office from 335 Huntington Avenue to 238 Hemenway Street, near Huntington Avenue.

Dr. Alpha R. Sawyer has moved his office from 483 Beacon Street, Boston, to 371 Commonwealth Avenue.

Dr. Samuel C. Mintz has moved his office from 419 Boylston Street to 371 Commonwealth Avenue. Boston.

Dr. Burton E. Hamilton from 475 Commonwealth Avenue.

Dr. Albert E. Rogers has moved his office from 15 Bay State Road to 60 Charlesgate West, Boston.

Henry Baker, M.D., announces the removal of his Dorchester office, 806 Blue Hill Avenue, to 232 Seaver Street, Roxbury. His Boston office is 483 Beacon Street, Boston, corner Massachusetts Avenue.

Dr. F. S. Cruickshank has moved his office from 23 Bay State Road to 47 Bay State Road, Boston. His residence has been changed to 312 Thatcher Street, Milton.

REPORT AND NOTICES OF MEETINGS

DEDICATION OF THE FOURTH HEALTH UNIT UNDER THE PROVISIONS OF THE WILL OF GEORGE ROBERT WHITE

The Trustees of the George Robert White Fund invited a large number of persons interested in public health to attend the Dedicatory Exercises of the Health Unit which has been erected and equipped on Blue Hill Avenue and Savin Street, Roxbury, Massachusetts, on Tuesday, September 24, at 11 A. M. This is the Fourth Health Unit which has been erected and furnished under the provisions of the George Robert White Fund and two others will soon be added to the group giving service to the various districts in the city of Boston.

The provisions of the will under which these units have been created are as follows:

". . . and I do now give all the rest and residue of my property of every nature to the City of Boston, the same to be held as a permanent charitable trust fund to be known as the George Robert White Fund, and the net income only to be used for creating works of public utility and beauty, for the use and enjoyment of the inhabitants of the City of Boston."

The Trustees were particularly fortunate in being able to utilize the property formerly occupied by the Hugh Nawn Company, which enabled them to complete this unit at a cost something under $250,000. The architects of this and the other health units are Coolidge, Shepley, Bulfinch and Adams.

At one end of the entrance hall to the building the following words are inscribed:

A.D. 1929
Established for the Purpose of Teaching
the People Modern Methods of
Preventing Disease

The Gift of
George Robert White, a Citizen of Boston
1847-1922

Built from the Income of an Endowment Fund
Provided in His Will for Erecting
Works of Public Utility and Beauty

After the inspection of the building by the assembled guests, Mr. George E. Phelan, Manager of the George Robert White Fund, called the meeting to order in the open space adjoining the building, expressing himself as being particularly happy in the privilege of extending a cordial welcome to all who are interested in the promotion of public health. He referred to the life of George Robert White, eulogizing his public spirit, and explained the administra-

tion of the other health units and the contemplated building of two more, one of which will be dedicated soon and the last, a sixth, will have its corner stone laid in the near future.

He then called upon the Right Reverend Patrick J. Supple, Pastor of St. John's Church, Roxbury, to give the invocation.

Next on the program was the presentation of keys to the Trustees by Mr. Henry R. Shepley. Mr. Shepley in turn presented them to Mr. Thomas W. Proctor, President of the Boston Bar Association, who is one of the Trustees of the Fund. Mr. Proctor in transferring the keys spoke of Franklin, Parkman, and White as standing prominently among those who have contributed generously to the welfare of the city and spoke appreciatively of the character of the man who made it possible to add so much to the public health program of the city. In the absence of His Honor, the Mayor, Malcolm E. Nichols, Mr. Timothy F. Donovan, President of the City Council, accepted the gift on behalf of the City of Boston, expressing the regrets of Mayor Nichols in not being able to participate in the program, and assured the Trustees and the Manager of the Fund of the co-öperation of the City of Boston in maintaining the purposes of the bequest.

The keys to the building were then given to Dr. Francis X. Mahoney, Health Commissioner of the City of Boston, who in his official capacity is responsible for the details of administration. Dr. Mahoney made a strong appeal for the co-öperation of all citizens in maintaining the highest standards of health administration, especially urging the parents of children to take advantage of the protective power of vaccination for smallpox and measures for protection against diphtheria, stating that smallpox and diphtheria are diseases which can and should be eliminated. Progress to be made in public health administration, he felt, was very much under the control of the people and he urged that they co-öperate closely with the officials engaged in the work of preventive medicine. He paid tribute to the efficiency of Dr. Charles F. Wilinsky, who has been recognized as the inspiring spirit in the development and prosecution of the detailed work incident to the functions of the different health units, until recently.

He was followed by Rabbi Herman H. Rubinovitz of Mishkan Tefila Synagogue, Roxbury, who welcomed this addition to the public service of that district. He gave an eloquent address on the influence of education and civic ethics in relation to the development of human affairs. He especially stressed the importance of health in making for human efficiency.

Mrs. Sadie L. Shulman, Assistant Corporation Counsel, then spoke for the mothers and children of the city, explaining the modern conception of medicine in its relation to the welfare of the race, and expressed her appreciation of the advantages which will come to that district in which she has lived for many years and is now a neighbor of the unit.

Mr. Walter R. Meins, President of the Roxbury Historical Society, spoke at length of the history of that section, which was originally a suburb, but now has become a part of the corporate city, and expressed the feeling that the beautiful health unit which has been completed will tend to cement the interest of the city and add to civic betterment.

Dr. Charles F. Wilinsky was then introduced as a man of energy, enthusiasm and ability, with trained public health knowledge, who has been a most important factor in the development of the details of administration of the several units. His release from active participation in the work of this development is to be temporary according to the expectation of Mr. Phelan, who emphasized the regret which had been expressed because of Dr. Wilinsky's work as director of the Beth Israel Hospital. Dr. Wilinsky gave an interesting account of the early history and development of the several health units with which he had been connected and urged active co-öperation with all of them. His address is published on page 688 of this issue.

Another very interesting feature of the occasion was the presence of His Honor, Ex-Mayor Curley, who was in office at the time of the installation of the first unit and who has shown interest in the conduct of all of these developments of public health activities. He gave an inspiring address which added very much to the pleasure of the audience and which will undoubtedly stimulate great interest in public health administration.

At the conclusion of these exercises, upon invitation of His Honor, Mayor Nichols, a luncheon was served at the Ritz-Carlton for a considerable number of those who were able to attend. Only a very few speakers participated in the postprandial exercises but they were qualified to speak especially well of the problems incident to the development of these units.

First was Mr. George L. Driscoll, who congratulated the City of Boston on the interest shown by philanthropists and especially emphasized the importance of interesting öthers who were known to be of generous impulses, who would provide for the maintenance of these units, thereby relieving the city of a burden which could be carried on to the satisfaction of others who might be able to assist.

He was followed by Dr. George C. Shattuck, Chairman of the Boston Health League, who expressed hearty approval of the work which had been done with the appreciation of the privilege of being identified with these units. He spoke of the doubt in the minds of some in the early stages of the work of these units as to the realization of the ambitions of the promoters, but which was dispelled as it became demonstrated that these organizations are agencies for extending the work of the Health Department.

Mr. William E. Brigham, Editor of the *Boston Transcript*, spoke appreciatively of the co-öperation which had been made evident among the medical men of the City, and he further argued for additional endowments which will aid in promoting greater usefulness of these units.

Dr. Milton J. Rosenau, Professor of Preventive Medicine of the Harvard Medical School, explained that in the earlier stages of public health administration, trustees of various institutions seemed to be too much dissociated with public health authority.

Everyone has come to feel that here is a movement which brings into closer touch all who are engaged in promoting instruction in health matter. When the question has been asked as to where one might go for instruction in such matters, his answer has been, "Go and see Dr. Wilinsky."

Mr. Phelan brought the exercises to a close by

reciting a poem which has been a source of pleasure and inspiration to him all through his life.

Taken altogether, the exercises in connection with the Dedication of this Unit were well planned and arranged, and conducted with marked dignity.

VERMONT STATE MEDICAL SOCIETY

The One Hundred and Sixteenth Annual Meeting of the Vermont State Medical Society will be held at the Woman's Club Rooms, Town Hall, Bellows Falls, Vermont, Thursday and Friday, October 10 and 11, 1929.

Officers for 1928-1929

President—Charles F. Dalton.
Vice-President—George R. Anderson.
Secretary—William G. Ricker.
Treasurer—David Marvin.
Auditor—W. M. Johnstone.
Councillors—First District: T. A. McCormick, St. Albans; 2nd District: E. A. Tobin, North Bennington; 3rd District: F. E. Farmer, St. Johnsbury; 4th District: M. F. McGuire, Montpelier.
Executive Committee—W. G. Ricker, A. L. Miner, James Hamilton.
Publication Committee—W. G. Ricker, C. F. Dalton, J. A. Wark.
Legislative Committee—C. H. Beecher, T. S. Brown, M. F. McGuire.
Medical Education—H. S. Goodall (1), S. W. Hammond (2), A. B. Bisbee (3).
Necrology Committee—L. A. Russlow, B. D. Adams, H. S. Pierce.
Medico-Legal—J. N. Jenne (1), W. N. Bryant (2), E. A. Hyatt (3).
Health and Public Instruction Committee—P. E. McSweeney, E. J. Quinn, H. F. Taylor, A. L. Patch, C. F. Dalton.

Delegates

Maine—F. E. Farmer.
New Hampshire.—O. W. Daley.
Massachusetts—A. C. Black.
Connecticut—B. A. Chapman.
Rhode Island—Charles Buchanan.
New York—John D. Lane.
A. M. A.—William G. Ricker.
Alternate A. M. A.—C. H. Beecher.
Anniversary Chairman—J. H. Blodgett.

New England Medical Council

C. F. Dalton, William G. Ricker, E. A. Hyatt, F. E. Farmer, J. A. Stevenson.

Local Committee of Arrangements

J. S. Hill, Chairman; J. H. Blodgett, W. D. Bowen, J. P. Lenahan, F. L. Osgood, J. A. Stewart, W. T. Tilley.

Ladies' Committee

Mrs. J. H. Blodgett, Mrs. W. D. Bowen, Mrs. J. S. Hill, Mrs. J. P. Lenahan, Mrs. A. L. Miner, Mrs. F. L. Osgood, Mrs. W. T. Tilley.

Officers of the House of Delegates

President—B. D. Adams, Burlington.
First Vice-President—L. H. Ross, Bennington.
Second Vice-President—H. G. Ripley, Brattleboro.
Secretary—J. E. O'Brien, Rutland.

PROGRAM

Thursday Forenoon, October 10, at Nine o'clock, at the Woman's Club Rooms, Town Hall

1. Call to Order by the President.
   Charles F. Dalton, M.D., Burlington.
2. Prayer.
   Rev. Herbert Livingston.
3. Address of Welcome.
   A. L. Miner, M.D., Bellows Falls.
4. Reports of the Officers and Committees.
5. Reception of the Delegates from other Societies.
6. Vice-President's Address.
   George R. Anderson, M.D., Brattleboro.
   Title: "Some Observations on Spinal Anaesthesia."
   Discussion: O. N. Eastman, Burlington, M. F. McGuire, Montpelier.
7. Paper, Clarence White, Montpelier, Commissioner of Industries.
   Title: "Workmen's Compensation Under the Vermont Law."
   Discussion—C. H. Swift, Rutland; J. A. Wark, Barre.
8. Paper, C. A. Ravey, M.D., Burlington.
   Instructor in Medicine, University of Vermont.
   Title: "Injection Treatment of Varicose Veins."
   Discussion—J. H. Woodruff, Barre; J. P. Gifford, Randolph.
9. Paper, Arthur J. Cramp, M.D., Chicago. Director Bureau of Investigation, American Medical Association.
   Title: "The Nostrum and the Public Health." Illustrated.

Thursday Afternoon at Two o'clock, at the Woman's Club Rooms, Town Hall

10. President's Address.
    Charles F. Dalton, M.D., Burlington. Secretary of Vermont State Board of Health.
11. Address, Benjamin White, Ph.D., Boston. Director of the Division of Biologic Laboratories, Department of Public Health, Mass.
    Title: "Serums and Vaccines in the Prevention and Treatment of Communicable Diseases."
    Discussion—Paul K. French, Burlington; E. M. Gardinier, Bennington.
12. Address, Robert B. Greenough, M.D., Boston. Visiting Surgeon at the Massachusetts General Hospital.
    Title: "Cancer Clinics, Their Difficulties and Advantages."
    Discussion—T. A. McCormick, St. Albans; P. E. McSweeney, Burlington.
13. Paper, Frederick W. Bancroft, M.D., New York. Associate Professor of Clinical Surgery, Columbia University.
    Title: "The Treatment of Cutaneous Burns."
    Discussion—J. A. Stewart, Saxtons River; L. E. Sample, St. Albans.

FIXED SESSION OF THE HOUSE OF DELEGATES 5 O'CLOCK, WOMAN'S CLUB ROOMS, TOWN HALL

List of members, reports of the committees and the order of business are printed in pamphlet form. Copies may be obtained at the registration desk.

THURSDAY EVENING, AT SEVEN-THIRTY O'CLOCK AT THE HOTEL WINDHAM

The Annual Banquet.
Anniversary Chairman.
J. H. Blodgett, M.D., Bellows Falls.

FRIDAY FORENOON, NINE O'CLOCK, AT THE WOMAN'S CLUB ROOMS, TOWN HALL

14. Report of the House of Delegates.

Symposium on Diseases of the Respiratory Tract

15. "The Common Cold."
Frederick N. Sperry, M.D., Clinical Professor of Laryngology, Yale School of Medicine and Laryngologist-in-Chief, New Haven Hospital.
16. "The Diagnosis and Treatment of Hay Fever."
James D. Trask, M.D., Associate Professor of Pediatrics, Yale School of Medicine and Associate Pediatrician, New Haven Hospital.
17. "The Surgical Treatment of Chronic Diseases of the Respiratory Tract."
Samuel C. Harvey, M.D., Professor of Surgery, Yale School of Medicine and Surgeon-in-Chief, New Haven Hospital.
18. "The Diagnosis and Treatment of Pneumonia."
Francis G. Blake, M.D., Sterling Professor of Medicine, Yale School of Medicine and Physician-in-Chief, New Haven Hospital.
Discussion—E. J. Rogers, Pittsford; R. E. Avery, Barre; R. H. Seeley, Rutland; E. G. Twitchell, Burlington.

ENTERTAINMENT

Announcements will be made at the place of meeting and at The Hotel Windham.

An entertainment and tea will be given the visiting ladies at the home of Dr. and Mrs. J. S. Hill, 35 Atkinson Street, from three to five Thursday afternoon.

An automobile sight-seeing trip to neighboring points of interest will be given the visiting ladies Friday forenoon. Cars will leave the Hotel Windham at nine o'clock.

NOTES

The Headquarters of the Society and Registration Desk will be at the Woman's Club Rooms, Town Hall, during the hours of sessions.

The usual exhibit of medical and surgical supplies will be at the Woman's Club Rooms, Town Hall.

Hotel Reservations

Reservations of rooms can be made at and through The Hotel Windham.

BY-LAWS

Article IX—Time for Papers

No author shall consume more than twenty minutes in reading or presenting a paper and no one shall speak more than five minutes in the discussion of a paper, without unanimous consent of the members present.

Article X—Addresses Property of Society

All addresses and papers presented in the County and State Societies thereby become the property of the State Society, and shall be placed in the hands of the Secretary within one week after the meeting, for insertion in the Transactions.

Article XI—Order of Business

The program as prepared by the Executive Committee and published in accordance with the By-Laws by the Secretary shall constitute the order of business, and can not be changed, or suspended, except for a definite purpose, a limited time and by a two-thirds vote of the members present.

WINTER TRAINING COURSE FOR MEDICAL RESERVE OFFICERS

The first of the Medical Reserve Officers Winter Training meetings, 1929-30, will be held at the University Club, 40 Trinity Place, Boston, at 8:00 P. M., October 9. As has been customary in the past, there will be a subscription dinner, for which it is hoped to have as guests several interesting speakers. The cost of the dinner will be $1.75.

It is hoped that all Reserve Officers of the Medical Department who can do so will attend.

Officers attending the meeting will be given credit for participation in Military Activities.

MEETINGS OF THE HAMPSHIRE DISTRICT MEDICAL SOCIETY

The meetings of Hampshire District will occur at 11 A. M. the second Wednesdays of October, December, February, and April and will be held at the Dickinson Hospital, Northampton. The annual meeting will be held in May. The October meeting on the 9th will be addressed by Dr. Frederick D. Jones of Springfield, subject: "Some Unusual Experiences of the Medical Examiner".

LUTHER O. WHITMAN, M.D., *Secretary.*

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

October 29. This meeting comes at the invitation of Plymouth District Medical Society, to be held in Massasoit Hall, 6 Main Street, Brockton, at 8 P. M. Dr. Chevalier Jackson of Philadelphia will give an address, "Bronchoscopy as an Aid to the Internist and Surgeon in the Diagnosis and Treatment of Diseases of the Lung". Lantern slides and moving picture demonstrations.

ALEXANDER A. LEVI, M.D., *Secretary.*

NEW ENGLAND SOCIETY OF PSYCHIATRY

The regular Fall meeting of the Society will be held with Dr. Clarence A. Bonner at the Danvers State Hospital, Danvers, Mass., Tuesday, October 8, 1929.

PROGRAM

"Moving Picture Demonstration of the Effect of the Inhalation of Carbon Dioxide in Certain Neuro-Psychiatric Conditions." H. C. Solomon, M.D., Boston, Mass.

MASSACHUSETTS STATE NURSES' ASSOCIATION

The Autumn meeting of the Massachusetts State Nurses' Association will be held at the Northampton Hotel, Northampton, Mass., Friday, October 4.

A very interesting program has been announced.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

October 4—Massachusetts State Nurses' Association. Complete notice appears above.

October 8—New England Society of Psychiatry. Detailed notice appears on page 706.

October 7-19—New York Academy of Medicine. Detailed notice appears on page 657, issue of September 26.

October 8—The Harvard Medical Society. Detailed notice appears on page 658, issue of September 26.

October 9—Winter Training Course for Medical Reserve Officers. Complete notice appears on page 706.

October 10-11—Vermont State Medical Society. Detailed notice appears on page 705.

October 13-18—General meeting of the International Society of Medical Hydrology and International League for Combating Rheumatism. Detailed notice appears on page 288, issue of August 8.

October 14-18—The next annual Clinical Congress of the American College of Surgeons will be held in Chicago.

FRANKLIN H. MARTIN, M.D., General Director,
American College of Surgeons,
40 East Erie Street, Chicago.

October 21, 22, 23, 24, 25—International Assembly of the Inter-State Post-Graduate Medical Association of North America. For detailed notice see page 341, issue of August 15.

November 4, 5, 6 and 7, 1929—Clinical Congress and Eighth Annual Meeting of the American College of Physical Therapy. See page 149, issue of July 18, for details.

December 2-6—The Radiological Society of North America. Complete notice appears on page 149, issue of July 18.

May 5-10, 1930—First International Congress on Mental Hygiene. See page 191, issue of July 25, for details.

DISTRICT MEDICAL SOCIETIES

Franklin District Medical Society

The meetings of the Franklin District Medical Society will be held at the Weldon Hotel, Greenfield, Mass., on the second Tuesdays of November, January, March and May, at 11 A. M.

CHARLES MOLINE, Secretary.

Hampden District Medical Society

The next meeting will be held October 22 at the Springfield Academy of Medicine.

The program will be arranged by Dr. L. E. Phaneuf and the Section of Obstetrics and Gynecology.

Details will appear later.

HERVEY L. SMITH, Secretary.

Hampshire District Medical Society

October 9—Detailed notice appears on page 706.

Middlesex East District Medical Society

October—Joint meeting with Middlesex North and Essex North and South.

November 13—At Reading.

January 15—At Boston, Harvard Club.

March 12—At Melrose.

May 13—At Unicorn Country Club.

ALLAN R. CUNNINGHAM, Secretary.

Middlesex South District Medical Society

October 17—Newton Hospital. Surgical, medical and pathological demonstrations. Speaker and complete program to be announced later.

October 29—Complete notice appears on page 706.

November 6—Censors' meeting.

April 16, 1930—Annual meeting. Commander Hotel, Cambridge. Program to be announced.

Winter meetings—jointly with Suffolk District.

May, 1930—Censors' meeting.

ALEXANDER A. LEVI, Secretary.

Norfolk District Medical Society

Schedule of meetings for the year 1929-1930. Invitations have been sent to the speakers and the list is true only on condition of their acceptance.

October 29—Medfield State Hospital, Harding, Massachusetts. Papers by the Staff.

November 25—Roxbury Masonic Temple. Dr. Roger Graves, "Urology from the Standpoint of the General Practitioner." Surgical discussion. Medical discussion.

January 27, 1930—Roxbury Masonic Temple. "Recent Advances in Diagnosis and Treatment of Syphilis." Speaker to be announced.

February 24, 1930—Roxbury Masonic Temple, 8:00. Dr. Edwin H. Place has been invited to read a paper and has been given carte blanche in the selection of his subject.

March 24, 1930—Roxbury Masonic Temple. Dr. Burton E. Hamilton. Subject to be announced.

May 6, 1930—Annual Meeting. Program to be announced.

The Censors meet for the examination of candidates, November 7, 1929, and May 1, 1930, in the Roxbury Masonic Temple, 171 Warren Street, Roxbury, at 4:00 P. M.

Applications must be in the hands of the Secretary at least one week previous to date of examination.

Owing to inability to engage the Roxbury Masonic Apartments on the last Tuesday of the month, such meetings as will be held in the Roxbury Temple will be held Monday evenings as per the dates above.

FRANK S. CRUICKSHANK,
Secretary, Norfolk District Medical Society.

Plymouth District Medical Society

October 29—Massasoit Hall, 6 Main Street, Brockton, at 8 P. M. Speaker, Dr. Chevalier Jackson of Philadelphia. Subject: "Bronchoscopy as an Aid to the Internist and Surgeon in the Diagnosis and Treatment of Diseases of the Lung." Lantern slides and moving picture demonstration.

All physicians, members of the Massachusetts Medical Society are cordially invited to be present. **This is an important meeting.**

THOMAS H. McCARTHY, President.

IMPORTANT NOTICE

Arrangements have been made for moving the offices of the NEW ENGLAND JOURNAL OF MEDICINE and the Massachusetts Medical Society to 165 Newbury Street, which will take effect within the next ten days. Please make a note of this change in order to avoid confusion.

BOOK REVIEWS

"The Cytoarchitecionics of the Human Cerebral Cortex". By VON ECONOMO.

This volume is intended by the author as an introduction to the study of the cellular architecture of the human cortex, and as an aid to the use of his larger book "Die Cytoarchitektonik der Hirnrinde des erwaschenen Menschen", published in 1925 with Dr. Koskinas as co-author. Myelin architecture is not dealt with in any detail.

The author, in starting out, divides the cortex from without inward, into the six main layers first described by Baillarger: (I) Molecular (II) Outer granular (III) Pyramidal cell (IV) Internal Granular (V) Ganglionic (VI) Fusiform. It is pointed out that this arrangement is largely arbitrary and that the lamination, which is most distinct in the anterior frontal and in the parietal areas, is modified in certain places to the extent that it is difficult or perhaps even impossible to identify all of the different layers. The variations serve to distinguish one cortical area from another.

On the basis of quite distinctive types of lamination the cortex is divided into five main areas. Each of these can be subdivided by reason of less distinct but definite differences so that more than one hundred separate areas have been recognized. In a summary of this kind, one has to be content with a brief mention of the five primary types described: (1) Agranular heterotypical (2) frontal (3) parietal

(4) polar (5) granular heterotypical. In types 2 and 3, frontal and parietal, the six laminae are very plainly seen. Type 4, polar, which occurs at the frontal and occipital poles, is narrower and contains a greater number of small granular cells, but is even more distinctly laminated. In type 1, best represented by the precentral gyrus, and in type 5 by the calcarine cortex, certain layers are almost, if not quite lost, or rather one type of cell is replaced by another so that the individual laminae can scarcely be differentiated. Pyramidal cells take the place of granule cells in type 1 while type 5 is largely made up of small cells with comparatively few pyramidal cells.

Measurements of the surface area and thickness of the cortex, the thickness of the different laminae, size of cells and cell counts are discussed, and the cellular arrangement of the main areas and their subdivisions is elaborated upon. It is pointed out that the boundaries of a particular area such as the motor or the visual cortex, cannot be determined accurately by gross anatomical landmarks but that they may be mapped out with the greatest precision by the minute architectural characteristics.

In the author's opinion, investigations made by him and others support the theory that the surface of the brain is divided by the fissure of Rolando into a posterior sensory and an anterior motor organ Small granule cells predominate in the sensory part and pyramidal cells in the motor, which in the precentral gyrus contains scarcely any of the granular type.

Reference is made to studies carried out on diseased brains, to the work of Jakob in particular. Of the conditions investigated, amyotropic lateral sclerosis appears to be the only one in which a restricted area of the motor cortex, is affected. In other diseases the pathological process is not limited to any one surface area, but seems to have a predilection for certain structural types of cortex, and an affinity for particular laminae. In the organic psychoses which have been studied, such as general paralysis and senile dementia, the most striking changes are said to be found in the anterior frontal and in parts of the temporal and parietal regions, and to involve chiefly the third lamina, which layer also seems to be particularly affected in chronic alcoholism and in dementia praecox. It is thus thought probable that involvement of the third lamina occurs in all organic and functional psychoses which are characterized by intellectual deterioration. In contrast with these disorders, the progressively degenerative diseases, such as Huntington's chorea, characterized by motor symptoms, seem to involve the precentral gyrus more than, though not to the exclusion of, other areas and to affect the fifth and sixth laminae in particular. The author believes that further studies of pathological material, particularly of various grades of mental defectiveness, together with studies in comparative anatomy offer a promising field of investigation, and may throw considerable light on the mechanism of cerebral function.

In addition to conclusions based on anatomical and pathological evidence, which many would probably consider too meager to be of great significance, or which they might be inclined to explain in some other way, a few pages are devoted to theoretical, largely speculative, considerations of cerebral function in a manner which is stimulating, and on the whole, not too positive. It is doubtful however, whether certain functions can as yet, if ever, be localized in the cortex with the precision which the author seems to consider possible.

The text is illustrated with diagrams and a number of micro-photographs.

Although it deals with a very special subject which has attracted only a few workers, a select group, who have been willing to devote to it the tremendous amount of painstaking labor which it demands, the volume will serve as a useful guide for those working with the normal or pathological histology of the brain, and may be read with profit by anyone interested in neurology. Through the efforts of Baillarger, Meynert, Betz, Campbell, Elliot Smith, Brodmann, Vogt, Marinesco, Von Economo and a few others, this particular branch of neuroanatomy has reached a stage of development which gives promise of interesting possibilities. A great amount of pioneer work is still to be done. A greater uniformity of nomenclature would, it seems, be a decided advantage.

The translation which is ably done, should be welcomed by English and American neurologists who wish to become more familiar with the structure of the cortex but have been disinclined to undertake the study of a difficult subject, the literature of which is to be found for the greater part only in foreign publications.

Diabetics, J. K. Lund. Faber and Faber, London, 1929. 87 pp.

This little manual for diabetic patients gives in almost too brief form the usual information regarding diet, insulin, and the avoidance of diabetic complications. A series of 15 diets leads to a maximum of between 92 grams of carbohydrate, indicating a tendency toward the use of low carbohydrate diets not in keeping with the most recent ideas of American students for diabetes. Simplified food tables are included.

Die Encephalitis lethargica; ihre Nachkrankheiten und ihre Behandlung, by Prof. C. v. Economo. Urban & Schwarzenberg, Berlin and Vienna, 1929. xii + 251 pages.

Professor von Economo's work on encephalitis is too well known to require much comment. His first observations of this disease were made in the winter of 1916-17. It seems reasonably certain now that this infection had not been previously known. The majority of the patients showed marked somnolence, interference with the extra-ocular muscles and moderate fever. Since then there has been an enormous amount of literature published on this disease and on this account we welcome Dr. von Economo's careful summary of what is known in regard to the clinical entity which he first described.

The book is a well printed volume of 250 pages, with a few illustrations and a good index, covering the main aspects of encephalitis lethargica. It includes chapters on the late manifestations, which have been such a striking feature of the disease The book is wretchedly bound, however, and falls apart on first examination. This seems very unfortunate, for the book has great worth as a monograph on a single disease with all aspects of which the author is thoroughly familiar.